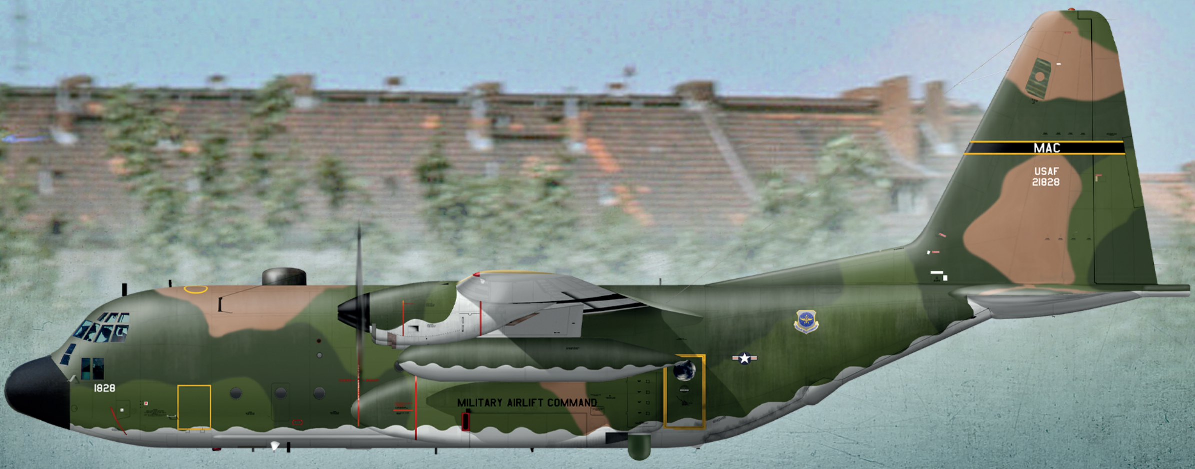
No.30

DANGER ZONE

US CLANDESTINE RECONNAISSANCE OPERATIONS ALONG THE WEST BERLIN AIR CORRIDORS, 1945–1990

U.S. AIR FORCE
USAF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MILITARY AIRLIFT COMMAND

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MALTA
CYPRUS

MAP OF EUROPE 1945–1992

Note: In order to simplify the use of this book, all names, locations and geographic designations are as provided in *The Times World Atlas*, or other traditionally accepted major sources of reference, as of the time of described events.

ABBREVIATIONS

ACC	Allied Control Commission
ADIZ	Air Defence Identification Zone
AGL	Above Ground Level
AMLM	Allied Military Liaison Mission
AO	Aerial Observer
ASA	Army Security Agency
ATC	Air Traffic Control
BAD	Berlin Aviation Detachment (US Army)
BARTCC	Berlin Air Route Traffic Control Centre
BASC	Berlin Air Safety Centre
BCZ	Berlin Control Zone
BG	Bomb Group
BRIXMIS	British Commander-in-Chief's Military Liaison Mission to the Commander-in-Chief Group of Soviet Forces in Germany
BS	Bomb Squadron
BUORL	Boston University Optical Research Labs
BW	Bomb Wing
CAP	Combat Air Patrol
COMINT	Communications Intelligence
CWO	Chief Warrant Officer
ECM	Electronic Counter Measures
ELINT	Electronic Intelligence
ESG	Electronic Support Group
EWO	Electronic Warfare Officer
FLIR	Forward Looking Infra-Red
GDR	German Democratic Republic
GSFG	Group of Soviet Forces in Germany
GvIAP	*Gvardiya Istrebitelnyy Aviastionyy Polk* (Guards Fighter Aviation Regiment)
IA	Image Analyst
IAP	*Istrebitel nyy Aviastionyy Polk* (Fighter Aviation Regiment)
IFR	Instrument Flight Rules
IGB	Inner German Border
IPIR	Initial Photographic Interpretation Report
MAC	Military Airlift Command
MASDC	Military Aircraft Storage and Disposal Centre
MAW	Military Airlift Wing
MLM	Military Liaison Mission
MMFL	*Le Mission Militaire Français de Liaison*
NCOIC	Non-Commissioned Officer In Charge
NIIRS	National Image Interpretability Rating Scales
NRO	National Reconnaissance Office
NSA	National Security Agency
NVA	*Nationale Volks Armee* – East German Army
OG	Operations Group
OL-G	Operating Location – Golf
OP	Observation Point
OS	Operations Squadron
PHOTINT	Photographic intelligence
PI	Photographic Interpreter or Photographic Interpretation
PPMS	Precision Parameter Measurements System
PR	Photographic Reconnaissance
PSMS	Phase Stability Measurement System
QRA	Quick Reaction Alert
RS	Reconnaissance Squadron
RTG	Reconnaissance Technical Group
RTS	Reconnaissance Technical Squadron
RWR	Radar Warning Receiver
SAC	Strategic Air Command (USAF)
SAM	Surface-to-Air Missile
SED	*Sozialistische Einheitspartei Deutschlands*
SEO	Special Equipment Operator
SERB	Soviet External Relations Bureau
SIGINT	Signals Intelligence. Coverall term for interception of all electronic emissions
SOXMIS	Soviet Military Liaison Mission
SRIS	Senior Reach Imaging System (KA-116)
SRW	Strategic Reconnaissance Wing
SS	Support Squadron
SSR	Soviet Socialist Republic
TAS/W	Tactical Airlift Squadron/Wing
USAAF	United States Army Air Force
USAFE	United States Air Force in Europe
USAFSS	United States Air Force Security Service
USAREUR	United States Army in Europe
USCOB	United States Command Berlin
USMLM	United States Military Liaison Mission
VFR	Visual Flight Rules
VOR	VHF Omnidirectional Radio beacon

INTRODUCTION AND ACKNOWLEDGEMENTS

Aerial intelligence collection was an integral part of Western efforts to discover Soviet capabilities and monitor their activities during the Cold War. From 1945, that involved employing modified Second World War bombers, exotic designs like the U-2 and SR-71 and a wide range of modified transport aircraft, through to the vast use of ever more sophisticated image and signals intelligence collecting satellites.

Tucked away in one corner of all this worldwide activity was Berlin. A political hotspot, an enclave deep inside Soviet-occupied territory, it was linked to the West by three invisible Air Corridors and an area of airspace over the City itself. Along those Corridors and over the City, one of the most successful intelligence collection operations of the Cold War was mounted. However, the success of nearly four decades of flights has been greatly undervalued in most works that have attempted to review Cold War intelligence collection operations. Why is that? The explanations are in part obvious, but other elements of the answer have gone largely unnoticed and unrecognised.

Of the three Western Allies that occupied West Berlin it was the United States with its considerable resources, that provided the vast majority of the effort devoted to the collection of intelligence along the Corridors and in and over the City itself. This book is an examination of that American effort, the aircraft and equipment used on these missions, much of it in the words of the men that flew them.

Most of the book charts the activities of the now, often self-described, 'Berlin For Lunch Bunch' from its beginnings in the aftermath of a destroyed Europe from 1945, through to its eventual reunification in 1990, after the fall of the Berlin Wall in 1989 and collapse of the GDR that finally ended the Four Power occupation of the City. Starting with the period of uncertainty up to the Berlin airlift, the book follows the time line through the development of specialised aircraft to collect intelligence to, from and over the City.

Danger Zone looks at how those programmes matured with the arrival of the C-97, through to the advanced technology that accompanied the operation of the C-130 from the mid-1970s through to 1991. It will examine the parts played by the Berlin Air Safety Centre, the Berlin Air Route Traffic Control Centre, the 'Big Safari' programme, the Military Liaison Missions, other ground SIGINT facilities in the City, the US Army's 'Lark Spur' operation and 49th Reconnaissance Technical Squadron.

Although the mission itself was declassified in the 1990s, because it was part of the Cold War 'black world', many of the relevant materials around it were destroyed long ago. Most of the details that are available, come from the participants themselves.

This book could only be written because of the generous contributions of time from many individuals. Therefore, my grateful thanks go out to all of those who have helped me put this account together. Thank you. My apologies for not naming everyone individually. Naturally, a few names stand out: Robert Zoucha for getting me started, Sam Baker, John Stephenson, Thomas Weinzierl, Craig Wilson, Jon Martin, Dennis Brookins, Bob Bregent, Rick Driesbach, Don Willey and Rick Fuller, Lousherry Meyer. My thanks to you all for being so generous with your time and memories.

I have drawn heavily upon official imagery for many of the photographs so acknowledgements are due to the USAF, USGS and others including the BRIXMIS, USMLM and MMFL Associations. However, the vast majority of the photographs used have been kindly given by individuals, with special thanks to my generous friends Ralf Manteufel, Sam Baker, Bob Bregent, Peter Seemann, Dave Welch, Manfred Faber, Eric Bannwarth, Don Gilham, Rob Schleiffert, Philippe Ferretti, Neil Aird, Rainer Haufschild, Les Vowles, RW Rynerson, Boris Rychilo, George Partridge, Rich Demero and Dannis van der Heiden for allowing me to use their images.

I would also like to thank Peter Jefferies, my long-standing colleague and earlier co-author of the first book on Allied aerial intelligence gathering related to Berlin, *Looking Down the Corridors*, for his help and support with this project. Again, my thanks to Hugo Mambour author of the wonderful *Red Stars Over Germany* website (https://www.16va.be/) for his assistance and generally making publicly available such a wonderful resource.

Above all, this book is dedicated to the men who flew and supported these secret Cold War missions, who rarely get the recognition they deserve. Any errors, misunderstandings or omissions are entirely down to me.

Kevin Wright

1

FROM GERMAN SURRENDER TO THE BERLIN AIRLIFT 1945–49

The US airborne intelligence collection effort across the world during the Cold War, was huge. From peripheral missions and shallow overflights by the US Air Force and US Navy to the deep penetration missions mounted over the Middle East and USSR up to May 1960 by CIA U-2s.

Around the borders of Eastern Europe, there were long term peripheral collection missions, but unsurprisingly, Germany came in for special attention for several reasons. The partition of the German state and the Air Corridors created for access to Berlin, provided long term close proximity to Soviet forces that did not exist anywhere else in the world. The three Air Corridors gave a legitimate reason to directly overfly many Soviet and East German military bases and training facilities that just happened to be underneath and close by them. As if this was not enough of a justification for a huge collection effort, the concentration of Soviet forces in Germany, in particular around Berlin, with the annual troop rotations, the regular military exercises and the arrival of new equipment, did provide such justification.

The agreed presence of Allied Military Liaison Missions (AMLMs) on the ground, was another unique feature of post Second World War German partition. They provided a wealth of opportunities for 'hand-to-hand intelligence gathering' and some coordination of effort added another invaluable dimension to the types and quality of intelligence that could be collected that was not possible anywhere else.

Therefore, it should be no surprise that the Western Allies invested large resources to collect intelligence along the Inner German Border, the Baltic coast and around Berlin. Although the average Westerner knew nothing of it, perhaps what would have surprised them was the sheer scale. Between 1945 and 1990, United States Air Forces Europe (USAFE) alone flew around 10,000 intelligence collection missions in the Berlin Corridors and Berlin Control Zone (BCZ), supplemented by, although dwarfing, similar efforts made by their British and French allies.

Those programmes developed as the years passed, growing in sophistication as technology advanced but they had begun among the chaos and confusion of the early post-war years. What was not realised initially, was just how valuable the intelligence collected by these flights and the AMLMs, would become to the worldwide knowledge base about Soviet and Warsaw Pact frontline military equipment, doctrine and operations.

Conference Air Access

The origins of what later became the concept of permanent Air Corridors into West Berlin, began among the destruction of early post-war Germany and preparations for the Potsdam summit conference in the summer of 1945. On 24 June 1945, US General Parks visited Berlin to review planning for the approaching 'Big Three' meeting. The wartime German airfield at Gatow, which later became the RAF's airfield in West Berlin, was selected as the air

ALLIED MILITARY LIAISON MISSIONS

Established in 1946 and 1947 under individual agreements between the respective Western Commanders-in-Chief and the Soviet Commander-in-Chief, three separate Military Liaison Missions were established with the USSR and accredited with a quasi-diplomatic status. The US Military Liaison Mission (USMLM) was assigned 14 passes, the British 31 and the French 18 accredited to the GSFG Headquarters at any one time.[1]

The primary purpose of the missions was to engage in confidence-building between the respective powers. However, their emphasis quickly shifted to intelligence collection although the official liaison function remained a core part of their work. The Western Missions each had houses in Potsdam from which touring activity started and generally finished. They generally stopped by to collect any last-minute updates and to confirm their safe return to East Berlin. Although these houses were 'sovereign' territory, activities there were closely monitored by the East Germans.

When touring throughout the GDR, mission personnel were unarmed, in working uniform and in specially marked military vehicles which were theoretically, 'sovereign' territory and 'inviolable'. Tours normally comprised a specially trained Tour Driver, mostly NCOs, with one or two Tour Officers trained in Warsaw Pact equipment recognition and knowledge of Russian or German. The AMLMs also maintained 'proper' HQs in West Berlin, which gave them much more security and flexibility. Reciprocal Soviet Military Liaison Missions were located at Bad Salzuflen, Lübbecke and Bünde, in each of the three Western zones often referred to as 'SOXMIS'.

Tours generally headed into the GDR to cover pre-determined objectives, but these were easily modified if developments on the ground warranted it. The Tour Officers observed and recorded what they saw, supplemented by photographs and later video recordings. They even sometimes returned with items of 'liberated' Soviet equipment and on a few occasions, even bits of ordnance. However, their relative freedom of movement was not unrestricted.

Missions were forbidden from penetrating designated 'Permanent Restricted Areas' (PRA), which supposedly put them 'off limits' and were used to protect high-value intelligence targets. Time-limited Temporary Restricted Areas (TRA) were regularly created to cover major military exercises or troop movements, often linking several PRAs together.

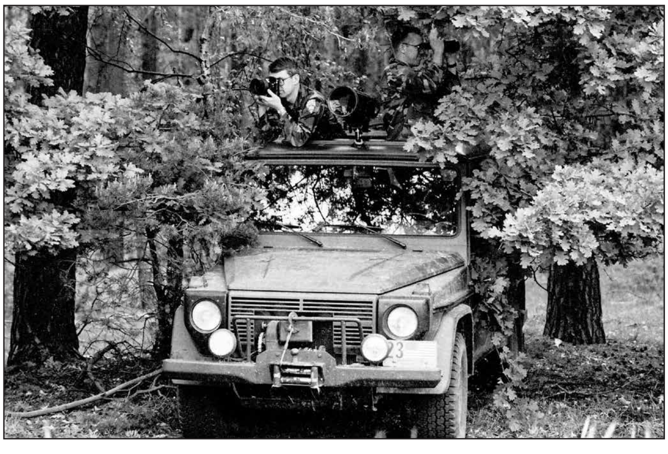
Such limitations hindered completely free mission movement. Unofficial 'Mission Restricted' signs were often placed in the GDR countryside in a futile attempt to deter the missions, but as they had no official status, they were ignored and many became treasured souvenirs for Mission members

They aimed to get as close as possible to the opposition by any means, often using 'stealth' approaches, simple bluster or employing deception to obtain the intelligence they sought. Their efforts were not unhindered. Tours were regularly followed by *Stasi* cars that tour drivers tried to escape from by using speed or driving across the countryside including unmade tracks and fields. When spotted, the Soviet military or East German security forces often attempted to detain them, which resulted in lengthy standoffs or a long wait until an officer from the Soviet command arrived to deal with the situation.

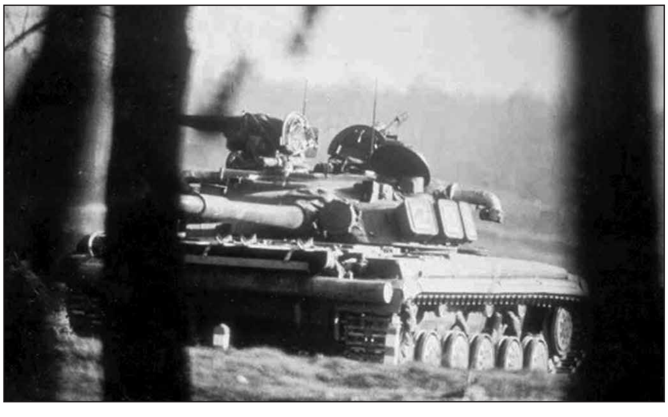
Many mission personnel often regarded this posting (retrospectively) as a highlight in their military careers. It was certainly a high-stress posting for many whilst others loved it. Some even experienced difficulty in returning to 'regular' soldiering afterwards. It could certainly be a dangerous job. Over the years there were numerous traffic accidents where Soviet, East German and other vehicles deliberately rammed mission cars.

There were other incidents where Soviet and East German forces administered beatings when they compromised an observation point, or during the detention of a Tour. In the early 1980s, when East-West relations were particularly poor, there were two fatalities. Adjutant Chef Mariotti of the MMFL was killed in a deliberately engineered traffic accident in 1984 and in 1985, Major Nicholson of the USMLM was shot and killed by a Soviet guard.

Some of the mission members' exploits were truly remarkable, achieving some spectacular intelligence 'scoops'. over the years. Fortunately, several former British and US mission members have now published detailed accounts of those activities that are well worth reading.



'On Tour' USMLM members often hid out close to Soviet and East German air bases to catch images and record military movements. (US Army)



Targets of opportunity such as Soviet troop movements and tank exercises were vital opportunities for MLM Tours to capture intelligence. (Howard Berner)

President Truman's entourage of C-54s arrived at Gatow airfield for the Three Power Conference at Potsdam in July 1945, their route to and from the event used a specially created temporary Air Corridor. (NARA)

'terminus' for the conference being just six miles from Potsdam, on the outskirts of the City, where these vital talks were to take place.

On Sunday 15 July 1945, President Truman's C-54, nicknamed 'Sacred Cow' left Brussels airport for Gatow accompanied by two more C-54s, two C-47 'baggage aircraft' and another with White House correspondents. The flight's course took it from Brussels via Liège, thence to Frankfurt, onto Kassel, via Magdeburg and finally, to Gatow airfield. It was escorted by US P-47 Thunderbolt fighters from Frankfurt as it headed towards Berlin. Twelve P-47s escorted the President's plane and four each for the other two C-54s. From Frankfurt onwards, they were over Russian-controlled territory and were required to remain within the temporary ten-mile Air Corridor that was specially created for the transit.[2]

Whilst relationships between the wartime allies in Germany remained relatively cordial, friction was growing. Between the February 1945 Yalta and July Potsdam meetings, much had changed; President Roosevelt had died, replaced by Harry Truman. During the conference, news reached Truman and Churchill of the successful detonation of the 'Trinity' atomic bomb in the Arizona desert on 16 July 1945. Churchill was voted out of office during the conference, in a British general election with the result delayed until 26 July. During the conference, it became clear that the fundamental issues of the borders and governance of Eastern Europe were moving against the interests of the Western Allies, or they remained so vague that nothing substantive could be agreed with the West who were largely unable to influence events on the ground. At the same time, fears about Soviet intentions and its fundamentally expansionist nature, expressed by George Kennan, were gaining traction within government circles in Washington DC.

The outcomes of Potsdam were far from positive. Until a permanent peace agreement could be agreed upon, Germany was to be jointly governed by the three wartime powers, the United States, Britain and the Soviet Union, to which France was later added, carved out of the US and British zones. Each was responsible for a section of German territory. Inevitably, each country managed its occupation zone differently, although there was greater cohesion among the Western sectors, even though lip service was being paid to the notion of an 'all Germany' approach.

Then there was Berlin, at the heart of the German Reich, around 100 miles within the Soviet-occupied zone. It was also symbolically divided into city sectors between the Allies, as a sign of their victory. The Western states had to establish their individual administrations within the City, to bring in equipment, personnel and supplies to their respective sectors. However, the Soviets were not prepared to accept uncontrolled Western access to the City and became increasingly irritated by it as time progressed. An early Western proposal called for six Air Corridors: Berlin-Hamburg, Berlin-Hannover (Buckeburg), Berlin-Frankfurt am Main, Berlin-Warsaw, Berlin-Prague and Berlin-Copenhagen. That list was reduced to three by the Soviets as they decided that the rejected routes were not necessary to support Western Allied forces in Berlin.

As East-West relationships over Berlin progressively deteriorated, from late November 1945 there was considerable political pressure to get a deal done, so detailed proposals finally began to move forward and eventually, did so rapidly. Several sessions of the Four Power specialist Air Directorate, within the Committee of Aviation, part of the Allied Control Authority Coordinating Committee, finally reached an agreement. These established three permanent Air Corridors to regulate the growing air traffic into Berlin.

Permanent Arrangements

On 31 December 1945, the agreement was signed by all the Allies' representatives that established the essential elements of the Air Corridor arrangements that operated until late 1990. A fading seven-page, 31 point document in the UK National Archives at Kew, details the main terms.[3] It established three Corridors, each '20 English miles (32 Kilometres)' wide that respectively connected Hamburg, Hannover and Frankfurt-am-Main to Berlin. The Southern Corridor was the longest at 187nm, the centre at 80nm and the Northern one at 96nm. The Corridors terminated in the 20-mile radius circle BCZ. The BCZ covered 'the air space between ground level and 10,000 feet (3,000 metres)'. The centre point of the BCZ was a pillar in the basement of the Allied Control Authority building in the Kammergericht building, Kleistpark, not far from Tempelhof airfield.

Almost daily US overflights of central Berlin meant the iconic Brandenburg Tor, the Soviet War Memorial and today's *Bundestag* were regular sights. (NARA)

The agreement also created the Berlin Air Safety Centre (BASC or *Centre de Sécurité Aérienne de Berlin* in its French form.) This was to be housed in the same building, to coordinate Corridor flights and traffic within the BCZ. The BASC was to be manned by representatives of all Four Powers. It was one of only two, four-power organisations in Berlin that continued to operate after the Soviet walkout from the Berlin *Kommandatura* in 1948. The Soviet boycott followed the creation of Western moves at currency reform in their occupation zones and led to the subsequent blockade of the City.

Much of the agreement specifies details like separation, speeds, course, 'overtaking' and general 'rules of the air' to be applied when operating within the Corridors and Zones in VFR and IFR weather conditions. What it did not address, was the purpose of flights to and from Berlin. The Western Allies claimed their access was unrestricted; the Soviets that flights had to originate in West Germany and were only for the re-supply of Western garrisons. Nor did the agreement specify the type of aircraft that could be flown in the Corridors. The West asserted there was no restriction and the Soviets, that it must only be transport aircraft. Neither did it specify any maximum altitude limitations for aircraft flown in the Corridors, whilst the Soviets insisted on a 10,000ft ceiling. Ultimately, the Western powers would have little choice but to acquiesce to these Soviet demands, deeply vulnerable as West Berlin was.

Berlin Air Safety Centre

The BASC operated 24 hours a day, all year round until its closure on 31 December 1990 to 'regulate traffic in the BCZ'. Each of the Four Powers had an element that continuously covered the BASC control room. Each national representation had a Chief Controller, Deputy Chief and Duty Controllers, all Air Force officers.

National representations were composed along the following lines:

United States

- One Chief Controller (usually Lieutenant Colonel or Colonel)
- Six Officers
- One Office administrator
- All US controllers were pilots until the late 1980s when navigators were first introduced

USSR

- One Chief Controller (Colonel)
- Four Officers
- Four Interpreters
- Plus an unknown number of personnel at Karlshorst. The controllers were qualified pilots.

United Kingdom

- One Chief Controller (usually a Wing Commander or Squadron Leader)
- Seven Officers (including a Russian speaker)
- One Office administrator
- All British controllers were from an ATC background, some also being qualified aircrew.

France

- One Chief Controller (usually a Commandant)
- Eight Controllers (senior NCOs)
- One Office administrator

The Soviets generally had both a controller and an interpreter on duty at all times. British Duty Controllers mainly coordinated traffic in the Northern and Central Corridors. US controllers did so for the busier Southern Corridor. The French acted as observers and recorded all flights through the three Corridors. The Soviets received flight data from the US and British Corridor controllers and relayed that information to their HQ at Karlshorst.[4]

The Corridors and BCZ were only available to aircraft of the Four Wartime Powers. Other nations' aircraft had to obtain prior permission from the BASC. Air traffic registered in the Federal Republic and GDR was excluded from transiting the Corridors. Only military flights were permitted to use the Corridors and BCZ, although in later years, this condition was relaxed to allow specified airline services from designated 'national carriers' of the Allied powers. BASC staff did not speak directly to transiting aircraft but passed the details of aircraft authorised to use the Corridors and BCZ to the Berlin Air Route Traffic Control Centre (BARTCC) located at the US managed Tempelhof airfield.

Originally, outbound civil aircraft departure data was usually passed to the BASC by teleprinter from BARTCC with military flight plans telephoned through from Tempelhof, Gatow and Tegel. To ease life for the Russians, the BASC control room recorded North Corridor flights on blue cards, Centre Corridor on yellow cards and white cards for the Southern Corridor. Inbound traffic data was usually passed to BASC by teleprinter or telephone from the Hannover and Frankfurt air traffic control centres, repeated to BARTCC where the USAF personnel provided the required air traffic services using its radar and own controllers. At Tempelhof, both the British and French maintained a small presence to coordinate and liaise with the US controllers and BASC on matters affecting their military and civil flights. For the most part, the Soviet BASC controllers recorded the data they were supplied with unless there was some objection, in which case it was discussed between the Soviet and Western controllers.

The various BASC elements maintained direct communications with those they regularly worked with, which for the Americans included: Frankfurt Flight Service, Base Ops, Aeronautical Information Services and ATC at Tempelhof, Terminal Control Area (TCA) and the Kinsbach command post. There were different arrangements for classified communications traffic. Protests between the Western elements and Soviets were dealt with on an escalating scale from oral statements, oral protests, written statements and written protests. However, daily interactions were said to nearly 'always be cordial, even when protests and statements are being made one to the other'.[5]

At its simplest, departure flight plans were filed with the BASC at least two hours before take-off. The flight's originating departure airfield in the Western Zones of Germany and termination in Berlin, or vice versa, would be verified. Direct flights into Berlin from France, the UK or US were not permitted as flights into the City were only supposed to be made in support of their respective military presences in Berlin. After confirming the flight's eligibility to use the Corridors and BCZ through meeting conditions such as nationality and aircraft type, the BASC produced a 'flight safety card'. This could take one of three forms:

1. Permission Granted, Safety of Flight Guaranteed
2. Permission Granted, Safety of Flight Not Guaranteed
3. Permission Denied

The flight would then be cleared to transit the Corridors and BCZ. All flights were obliged to obey BARTCC instructions. The BASC also recorded alleged infringements of Corridor and BCZ rules. The complete denial of permission to fly was very rare. However, it soon became standard practice for the Soviets to stamp the flight cards of Western, mainly light aircraft flights from the Western airfields in Berlin, around the BCZ 'Safety of Flight Not Guaranteed'. This was an indication that the Soviets objected to these flights moving outside the Western sectors of the City, but which they could do little about as they were permitted by the 1946 agreement, as long as they remained within the designated BCZ. Allied helicopters generally remained over the Western sectors of Berlin.

Flexibility

The main elements of the December 1945 agreement were incremental; what had been agreed upon and worked in the past became the pattern for the next step. Inevitably, the relatively broad Corridor agreement could not adequately cover every contingency of daily operations. What developed over the years was, in many senses, done by 'trial and error'. There were sometimes different interpretations of the main terms of the agreements between the Western Allies and the Soviets. What gradually evolved was often the outcome of custom and practice that gradually filled in the fine detail absent from the original agreement.

A new 'restriction' or 'objection' would sometimes be raised by the Soviets to some 'excess' they felt that Western aircraft were perpetrating. That new restriction would usually be rejected by one or more of the Western powers. They would then deliberately and openly flaunt the new Soviet restriction to see if there was any reaction. More often than not, there was little more than a protest, sometimes not even that. However, when there was a Soviet reaction, the Western powers – when they felt it did not adversely affect their vital interests – generally reached some accommodation, often in the form of a tacit recognition of the objection and modification of the offending behaviour. Alternatively, they might adopt an informal compromise that would see a general acquiescence of the Soviet restriction in practical terms, but with the Western Allies not granting formal recognition to the new reality.

One example of an informal compromise was the very early Soviet assertion that the Corridors were only to be used for the re-supply of Western garrisons in Berlin and therefore, flights should be restricted to unarmed transport aircraft. That claim was rejected by the Western Allies. The Soviets later pressed their case again but it was also rejected by the Allies. Subsequent attempts to fly combat aircraft types down the Corridors were responded to robustly by the Soviets. Despite the Western Allies continuing to reject the Soviet position, it became 'custom and practice' that only unarmed transport and training aircraft used the Corridors and BCZ.

Similarly, the Soviets denied the right of Allied aircraft to operate either above 10,000ft or below 2,500ft in the Corridors, even though there were no specific altitude restrictions detailed in the original Corridor agreement. In the early years, the absence of aircraft pressurisation meant that generally most aircraft normally flew below 10,000ft. Once aircraft pressurisation became more commonplace, the Soviets continued to insist that the maximum altitude was still 10,000ft. This was borne by the simple assertion that as it was OK in the past, why change it now? The Western Allies felt this was another Soviet attempt to turn a 'standard practice' into a rigid rule. Eventually they reluctantly, but not formally, accepted the Soviet height restrictions in the Corridors being between 3,500ft and 10,000ft and in the BCZ, from 2,500ft to 10,000ft.[6]

THE KLEISTPARK BUILDING

The four flags on the balcony above the entrance to the Kleistpark building (in the Western sector) were the most obvious signs of Allied occupation and the presence of the BASC. Former Senior US Controller Rick Fuller described the layout of the building during its BASC days.

> These flags were displayed in a specific order from left to right that changed each month. These were put out each day by the US Army guards to the building and surrounding park. Sometimes the young soldiers got it wrong or didn't know the protocol and we would have to keep asking them to change the flags around. Of the approximately 550 rooms, we used about 20 at most. We could wander around the whole five-storey building as it was otherwise empty. It had a large showpiece staircase, central dome and chandeliers. Only personnel from the four Allied powers were officially allowed in the building, although we had a couple of German drivers and German maintenance staff around who looked after the building's structure.
>
> The main rooms we used were at the top of the entrance stairs to the building, a sort of elevated ground floor. Inside was the main control room. At the centre of it was a desk with space for a controller from each nation.

By Rick's time, each had a touchscreen computer connected to BARTCC at Tempelhof.

> We would print a flight strip for an aircraft that required authorisation to enter one of the Corridors and passed it along to the Soviet Controller. He would take the flight data strip and call their HQ at Karlshorst in the south-east of Berlin, to pass the information onto the Soviet/GDR air defence people

The huge Kleistpark building near Tempelhof AB was home to the Berlin Air Safety Centre, its only permanent occupant and was guarded by a Detachment from the US Army. (RW Rynerson)

Attempts to fly above the 10,000ft ceiling were always robustly protested by the Soviets. On 27 March 1959, the US flew a C-130 into Berlin at 23,000ft to 'assert their access rights'. However, there was a strong Soviet protest:

> On March 27 a C-130 type American transport plane, going from West Germany to Berlin along the Air Corridor lying over the territory of the GDR, rose to a height of 7,000 metres, which is a crude violation of the existing procedure of flights along this route. The demonstrative character of this violation is evident from the very fact that the American representative in the BASC, which regulates flights of foreign airplanes between Berlin and the Federal Republic of Germany, was informed in good time by the Soviet side about the inadmissibility of the flight of the said plane at a height of more than 3,050 metres, which is the maximum for flights of the Western powers using the Air Corridors. Moreover, this same airplane, completing on the same day a return trip from Berlin to West Germany, again flew at a height twice exceeding the usual ceiling of flights in the Air Corridors.[7]

Soviet attitudes towards the day to day Corridor operations were often interpreted by Western observers as intransigence or excess rigidity and an unwillingness to adapt. A more nuanced interpretation suggests that despite the view of the USSR as a ruthless totalitarian regime in the West, it often operated in its own rigidly legalistic way, firmly adhering to its own institutional mechanisms and rules, whatever the West might have felt about their approach.

Early Post-war Operations

In 1945, the Allies started a joint US–UK imagery collection programme over their respective occupation zones in Germany. Accurate mapping of the continent would serve multiple purposes. These included assembling an objective record of the conditions and damage levels across Europe. It was used to create more accurate ground maps, help assess economic reconstruction needs and was a contingency against possible future military needs. Already well aware that post-war Soviet relations were likely to be difficult, both the British and Americans were concerned that they lacked the detailed map information that would be required in the event of any future hostilities.

These early photographic operations were largely piecemeal and used an eclectic mix of available aircraft. In November 1945, the US 45th Reconnaissance Squadron was a composite unit based at Fürth AB, near Nürnberg. They began to use their P-51D Mustangs and F-6Ks (the new designation for the photographic reconnaissance version of the P-51 Mustang) to collect imagery over Germany. Some anecdotal evidence suggests that they were used in the Corridors until their withdrawal in 1948, perhaps hastened by Soviet protests.

Details of these sorties are sparse, but by the summer of 1946, the squadron's 'Flight X' had flown a small number of camera-equipped A-26 Invaders on occasional covert Corridor reconnaissance missions. Retired USAF Major Roger Rhodarmer, then a captain, and an experienced A-26 pilot, was sent to Germany to join the 10th Reconnaissance Group. This was his first taste of photographic and then handed the data strip back to us. We then touched the computer screen again which confirmed the aircraft's authorisation to enter the Corridor which BARTCC passed to the aircrew. Off the control room, there was also a side room, for us to use if required.

Rick continued:

There were five Murphy beds, for those on night duty as we slept in the control room as well. Attached to the main room was a fully functioning, modern American equipped kitchen. Every day the French from Tegel airfield provided lunch for us, with a bottle of wine for each controller and another for the Soviet interpreter! Supper was a conglomeration of what each member brought in. I often brought in hamburgers and it was not unusual for the Soviet Controller to bring in a Carp they had caught from one of the hundreds of lakes around Berlin and it was always expertly prepared.

Being with the Soviets 24 hours a day, we talked about all things social, economic, political and everything else. We also had TV services from each of the four nations and a VHS recorder for movies. By far the most popular one for the Soviets and which I had to see hundreds of times was Tom Cruise and Top Gun. They loved that movie.

Outside in the hallway, there were four more doors that led off it and were the entrances to each nation's Senior Controllers and administrative offices. Both US and French representations had female administrative staff, with the British using an RAF Airman. The Soviets did not have permanent staff in West Berlin. Each day two Soviet officers, a controller and interpreter, drove over in the morning for their 24-hour shift.

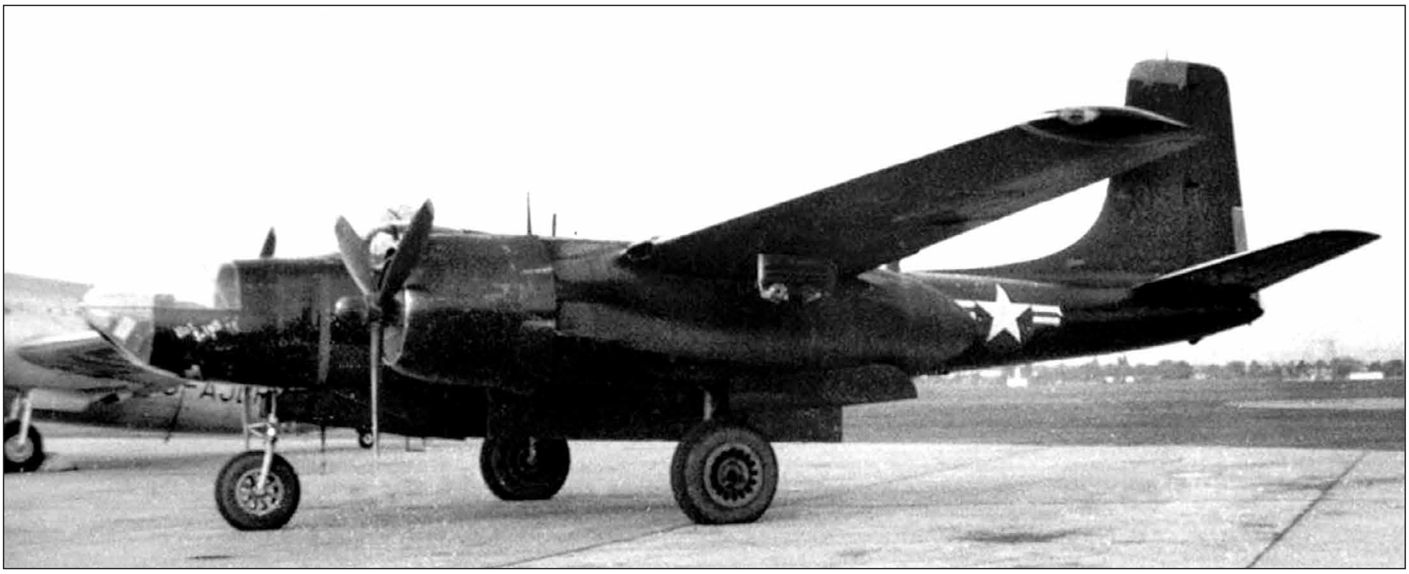
A bit further along there were another couple of rooms that we used for our monthly 'hail and farewell' parties. Usually twice a year there was a formal diplomatic dinner at the BASC which was a 'big ticket event' in Berlin and offered a chance to meet a 'real Soviet'. Down in the 'basement' of the building, there were three office sized rooms for stores, one of which in our case, was used as our liquor cabinet, kept well supplied by the State Department.

After the Kleistpark building was vacated by the Four Powers it was extensively restored to its former glory and is now the home of the Berlin *Kammergericht*, constitutional court and the State Attorney General.

The BASC main control room was manned 24 hours a day by representatives of all four Allied powers. Their work required genuine close cooperation. Soviet Major Vladimir Zhurba and RAF Flt Lieutenant Nigel Thomas in discussion. (USAF/Chief Master Sergeant Don Sutherland)

reconnaissance flying. On arrival, he was shown a modified A-26 that had been fitted with a carefully concealed, forward-facing oblique K-18 camera, with a 24in lens installed in the nose for Corridor missions. However, most of the two units' photographic reconnaissance tasks at that time were devoted to Project Birdseye; this involved flying 80 to 90 hours a month on photographing industrial and infrastructure 'targets' all over Europe, flying at low-level. That project terminated in late 1946.[8] In March 1947, the 45th RS moved to Fürstenfeldbruck AB in Bavaria.

'Flight X' continued occasional Corridor flights with their A-26s, now re-designated RB-26s, in 1948 and which remained in service up to 1958. Using the call sign 'Slot', up to nine aircraft operated with the squadron, although only four aircraft were usually on strength at any one time. During that period, there were two RB-26s losses. On



RB-26Cs were used for Berlin and Vienna Corridor flights from 1948 to 1958 by the 7499th SS, including this one (44-35914) named 'Hot Lips' photographed at RAF Northolt in July 1948. (Les Vowles)

CASEY JONES

As well as the efforts to photograph Germany, the US Army Air Force and RAF took on imaging much of the rest of Western Europe for similar reasons. Even before the end of Second World War, it had been recognised by many in senior command positions that:

> The lack of adequate maps and charts had caused serious difficulties for the American ground forces during the European campaign. A requirement thus existed for accurate maps for fire control, fire direction, and terrain feature profiles. The scope of the mapping project – more than two million square miles – was probably the largest single aerial mapping project up to that time. It demanded a large number of aircraft.[10]

In late April 1945, B-17Gs from the 305th and 306th Bombardment Groups (Heavy), then based respectively at RAF Chelveston and RAF Thurleigh, were withdrawn from their bombing role, their protective armour, armament and turrets removed and the aircraft readied for the installation of cameras. They were to be allocated a major a massive and immediate task, split with the RAF, to photograph: 'Continental Europe west of the Russian zone, Iceland, North Africa to about 50 miles inland from the coasts, including the Azores, and the Canary Islands'. from 20,000ft.[11] The installations were non-standard, crew chiefs largely led the work on their aircraft under some broad guidance from specialists of the 19th Photo Mapping Squadron. Initially, the operation suffered from a shortage of maintenance and photographic specialists as the massive demobilisation of US military personnel in Europe rapidly took place.

Although there were significant exceptions, the British were to broadly cover northern Europe from approximately 50 degrees north, with the product shared between the two, as part of an early post-war intelligence sharing agreement reached between them in 1946.[12] British performance was also significantly hampered because of the shorter range of its twin-engine Anson and Mosquito photo-reconnaissance aircraft assigned to the task from its 58 Squadron.

The K-17 cameras and later, some K-18s were fitted in the B-17Gs:

> [They] were equipped with two cameras: one for the US and the second camera for the British. Both were installed in the floor well of the radio room and were synchronised to one intervalometer. The cameras operated in tandem and exposed film simultaneously to obtain two identical images and original rolls of film for each sortie. One roll was destined for the US and the other was to be offered to the British. Should the camera assigned to the British Mission malfunction and become inoperative, the Casey Jones crews would have to re-fly the mission flight line to obtain an 'original set' for the British.[13]

The 305th BG moved from Chelveston to St Trond in Belgium in July 1945 and in December 1945, to Lechfeld in Germany. The 306th moved from Thurleigh to Gibelstadt in December 1945, its 423rd BS already having moved to Istres Le Tube, near Marseilles in July 1945. The Group moved onto Fürstenfeldbruck in September 1946 and finally, to Lechfeld where both Bomb Groups were formally deactivated in December 1946 with approximately 40 of their B-17Gs destroyed by blowing off the tail section with explosives. The few unfinished photographic tasks and remaining aircraft were transferred to the 'Casey Little' team and later, other units. Before deactivation, their assignments had required them to operate detachments of aircraft from their main bases to other airfields including Gibraltar, Meeks Field in Iceland and Foggia in

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The first B-17s fitted with SIGINT equipment were pressed into service in 1947 against a wartime German radar identified in Yugoslavia. The aircraft were used occasionally at night in the Berlin Corridors during the airlift. (USAF)

Italy. In North Africa, operating bases included Tripoli, Tunisia, Marrakech, Liberia, Dakar and Port Lyautey in Morocco.

Post-war coverage of neutral countries probably proved the most challenging. The Spanish were reluctant to allow the American B-17s to overfly the country, despite their agreement to the activity and for some time, launched Me109 and FW190 to shadow the American aircraft. The Portuguese insisted the British perform the overflights of its territory, under the terms of the far distant 1373 'Anglo-Portuguese Treaty'. However, the USAAF 306th BG B-17Gs were assigned to perform flights over the Azores, where the British provided air defence cover and reportedly intercepted the US aircraft at the request of the Portuguese authorities.

By far the best-documented imagery from 'Casey Jones' missions comes from Switzerland. Following a very private intergovernmental agreement with the United States in April 1946, missions took place in May and June 1946 after the alpine snow had receded. Swiss observers joined some missions, with the Americans supplying negatives from these, probably in the same way as the British. The result was a complete photographic mosaic of the country, which the Swiss government has recently digitised and is now publicly and freely available.[14]

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The B-17s used for operation Casey Jones like this aircraft from the 305th Bomb Group had armour and armament removed and underside cameras installed. (USAF)

30 July 1952, one crashed in a valley near Roith, Austria. Although there were no crew fatalities, there were several major injuries. The following month, another aircraft crashed just southwest of Wiesbaden following an engine fire, resulting in the loss of two crew members.[9]

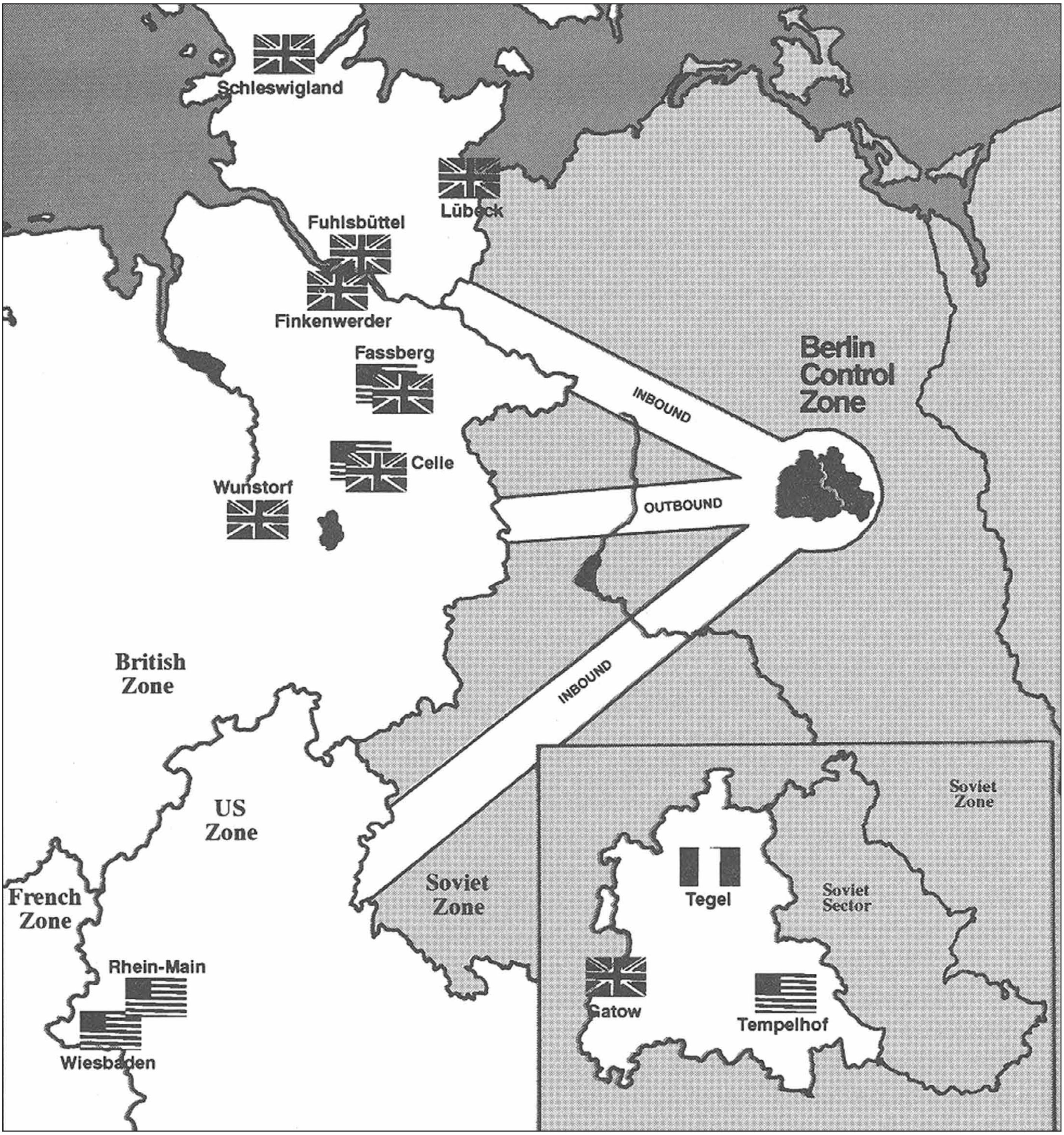
The RB-26's main camera fit at that time was a bomb bay mounted vertical K-17 camera with a 12in lens and a K-22 with a 24in lens, producing 9×9in images. The forward-facing K-18 was also retained, producing 9×18in images. The use of these aircraft attracted Soviet protests as being 'combat types' but USAFE's response was always that they were not on the strength of a combat unit and were only used for fast courier flights to Berlin and as VIP transports.

In 1947, an element of the remaining B-17s took on an emergency ELINT collection role. Two serious incidents close to the Austrian-Yugoslav border areas resulted in two USAF C-47s being shot down. The US authorities launched an investigation into how the Yugoslavs had so effectively intercepted the C-47s. Two B-17s were quickly fitted with wartime intercept receivers and direction-finding antennae. On their first flight, along the Austrian-Yugoslav border, close to where the C-47s had been intercepted, transmissions from a familiar wartime German 'Würzburg' radar were detected. They emanated from the site of a former German wartime radar school where Yugoslav operators were now being trained.[15] The mission's success soon encouraged USAFE to undertake further 'ferret' flights close to Soviet-occupied territory to try and identify the presence of other radars.

Berlin Airlift Missions

Tensions with the Soviets over the future of Germany had grown significantly during 1947. Slow deliberations within the Allied Control Council on the future of Germany were overtaken by American led efforts on the economic front. Increasing economic integration of the three Western occupation zones accelerated their recovery and reduced their dependence on especially overstretched British and French resources. However, it was the US goal of more fully including Germany's Western Zones within the evolving Marshall Plan, coupled with currency reform and the introduction of the Deutsche Mark that triggered a major, abrupt Soviet response. Having been ignored in the Allied Control Council, the Soviets showed their displeasure by withdrawing from it in March 1948. When currency reform took place in June 1948, they took even more decisive action, imposing a blockade on Western sections of the City.

When the Russians closed the land and water access routes to West Berlin on 24 June 1948, the only way to move supplies into Berlin's Western Zones was by aircraft. A massive, nearly year-long airlift quickly got going. That airlift became an astonishing achievement of modern airpower in support of firm political determination and which has been described as 'the greatest humanitarian airlift in history'. However, there were fears that the Soviet blockade could escalate into a shooting war so there was a requirement to collect intelligence about Soviet capabilities around the City.


Schleswigland
Lübeck
Fuhlsbüttel
Finkenwerder
Fassberg
Celle
Wunstorf
Berlin Control Zone
INBOUND
OUTBOUND
INBOUND
British Zone
US Zone
French Zone
Soviet Zone
Rhein-Main
Wiesbaden
Soviet Zone
Tegel
Soviet Sector
Gatow
Tempelhof

The Berlin Air Corridor routes from West Germany to West Berlin. (USAF)

The poor winter weather that often affects Berlin, meant high-quality weather forecasts were essential to ensure the high tempo of airlift operations. Later in the year, the 7169th Weather Reconnaissance Squadron (7169th WRS) was formed at Wiesbaden AB in November 1948. During the airlift, SIGINT equipped B-17s were occasionally used to collect intelligence along the Berlin Corridors operating under the guise of weather ships. The occasional substitution of an ELINT B-17 flight into the traffic flows, instead of a weather ship became relatively easy.[16] The ELINT missions conducted were relatively modest in number, careful not to complicate an already difficult and often tense situation.

A later report described how the early B-17 meteorological flights were used and demonstrate the relative ease with which an ELINT flight would be substituted for the normal weather flight and makes no mention of any reconnaissance missions:

> [US aircraft kept] track of the fast-changing weather conditions along the Corridors and relaying that data back to the originating bases. General Smith began the process on 9 July by arranging for a B-17 from Wiesbaden to fly the Frankfurt to Berlin Corridor above the cargo aircraft to watch for thunderstorms and to provide immediate reports on bad weather. The first of these flights took place late that evening. In early August, Tunner's operations section concluded that two aircraft in every block should report the weather back to airlift headquarters.[17]

UNIT ANCESTRY OF USAF CORRIDOR OPERATIONS

The ancestry of many US Air Force units is often very complex and that of the 7499th and 7405th Squadrons, the main units that flew Corridor missions, are no exception.

The early B-17Gs involved in reconnaissance did so via the 305th and 306th Bomb Groups whose aircraft were rapidly converted to photographic platforms before the War's end and committed to Project 'Casey Jones'. Some 306th BW B-17Gs ended up at Fürstenfeldbruck in early autumn of 1946.[19] Following the C-47 incidents over Yugoslavia in August 1946, two B-17s were fitted with intercept receivers and direction-finding antennae to hunt for suspected radar equipment. Their success encouraged wider use to search for Soviet radars elsewhere, so B-17 photographic and SIGINT aircraft gradually began flying some peripheral reconnaissance and Corridor missions. On 1 November 1948, the B-17 element became the 7499th Air Force Squadron.

A flight of the 45th RS at Fürth AB was established with RB-26C Invaders in 1946 and moved to Fürstenfeldbruck AB in 1947. The squadron's expansion saw it become the 7498th Air Force Squadron on 1 November 1948. Fitted with photographic and early SIGINT equipment, they operated until their final withdrawal in 1958. The 7498th was absorbed by the 7499th to become the 7499th Air Force Composite Squadron on 16 May 1949, renamed the 7499th Composite Squadron on 16 December 1949. The unit moved to Wiesbaden in August 1950.

On 10 May 1955, the squadron was 'upgraded' to become the 7499th Support Group at Wiesbaden with three component squadrons. The 7405th Support Squadron was responsible for Berlin Corridor and some peripheral operations. The 7406th Support Squadron was established at Rhein-Main and flew RB-50s on peripheral missions, part of the Airborne Communications Reconnaissance Programme. They were replaced by C-130A-IIs from 1958 until the squadron was inactivated on 30 June 1974.

The 7407th SS was also activated on 10 May 1955, with the most secret and high-risk role to conduct covert overflights of Eastern Europe. Its six RB-57As arrived at Rhein-Main in August 1955. Under Project 'Heart Throb', they flew covert high-altitude, photo-reconnaissance missions over Hungary and Czechoslovakia into 1956, after which their tasks were taken over by early CIA U-2 operations. The squadron briefly set up its Detachment 1 at Bitburg AB which used three modified RF-100As in operation 'Slick Chick', also for high-altitude reconnaissance missions over Eastern Europe. The Detachment was disbanded in July 1958.[20]

Having operated a mix of C-47s, T-29s and C-54s for some years, the 7405th Support Squadron eventually standardised on the Boeing C-97, remaining at Wiesbaden until their final retirement in December 1975, when facilities for their replacement C-130Es were completed at Rhein-Main AB. It became the 7405th Operations Squadron in January 1976, the title it retained until inactivated on 23 January 1991. On 1 July 1977, the 7575th Operations Group was formed at Rhein-Main AB. It took on responsibility for Corridor missions and two squadrons. The 7405th OS provided the aircraft and aircrew, including loadmasters and engineers. The newly activated 7580th OS provided the 'back-end' EWOs, Aerial Observers, Specialist Equipment Operators and sensor maintenance specialists. The Group was briefly responsible, until March 1983, for the 7th Special Operation Squadron at Rhein-Main with their MC-130Es. The 7575th OG disbanded on 31 March 1991 following the deactivation of the 7405th OS and 7580th OS in January 1991.

USAF C-47s on the Berlin Tempelhof airfield apron. Constructed in the pre-war years and still awaiting further repairs, it illustrates the huge size of its terminal and aircraft parking areas. It was the destination for all US flights into the City. (NARA)

All airlift flights into Berlin had to originate from West Germany and land in the city, but by declaring an 'emergency' that would necessitate an immediate return to the Western zones, the intelligence collection aircraft (and airlift aircraft with genuine emergencies) effectively sidestepped that restriction. B-17 crew member Lieutenant Inky Haugen indicated how their SIGINT missions only flew at night and never landed at Tempelhof because that would have compromised their true identity and mission. He explained:

> When we got to Berlin, we could not land. Our B-17s bristled with antennas and looked quite distinctive and, by agreement Soviet officers had to be allowed to watch movements from the control towers. When we reached the City, we had to call up and say we had landing gear trouble. Although these flights detected a few new radar sites, we found no new radar types.[18]

Up to eight B-17s were used at various times during this period. Ultimately they remained operational until 1953, even though the Soviets continued to object to their presence as 'combat types'. Their withdrawal was probably hastened by a combination of their clear obsolescence, mounting maintenance problems and continued Soviet protests.

When the blockade on Berlin eased from 12 May 1949, the airlift continued for some time as emergency material stocks were increased in case it was reimposed. By then, the Western will for currency reform, reconstruction funding and plans to merge the Western occupation zones, had advanced and froze the expected temporary geographical division of the immediate post-war City, into more permanent ones. Plans were developed and infrastructure put in place for possible future contingencies that might require another airlift into the City and the air defence of the Corridors.

Even as tension over Berlin was decreasing, the gap between East and West was widening and competition between the two blocs across the rest of the world gradually ratcheted up. Intelligence collection in and around Berlin further intensified, becoming even more systematic and increasingly sophisticated. To many, it was soon being described as the 'espionage capital of the world' as intelligence organisations competed for dominance in this divided city. Aerial intelligence collection became an integral and routine part of those activities.

2

AN EVOLVING CAPABILITY

Following Stalin's ending of the Blockade, it was clear that the Western Allies were not easily going to be forced out of West Berlin. Along with that, went hopes for a full resolution of the 'German question'. Even before the formal end of the blockade on 12 May 1949, the formation of NATO the previous month had again twisted the Bear's tail. The sudden North Korean invasion of the South on 25 June 1950, certainly caught the United States unprepared and added enormously to the level of international tension.

The Cold War continued to deepen as George Kennan's ideas of 'Soviet containment' quietly gathered pace within US foreign policy and defence circles. It galvanised a huge military rearmament programme. The rationale for that expansion was guided by a very secret National Security Council paper titled the 'United States Objectives and Programmes for National Security' from 7 April 1950. Better known as National Security Circular 68 (NSC 68) it was not even declassified until 1975. It provided the framework on which a tough US response to counter the Soviet Union, characterised as expansionist and hostile to the West, was constructed. It opened the door to those in the Truman administration who sought a huge military expansion that would create a US military dominance. It was to provide economic assistance, weapons and equipment to its European allies and enemies of the USSR across the world. One key, but a very clandestine element of this robust overall response, was the development of a vast, technologically advanced, ultimately global and completely unrivalled intelligence collection and analysis capability.

In the specific context of Germany and the Berlin Corridors, airborne intelligence collection activities developed along several paths. A major programme concentrated entirely on working along the Corridor and BCZ. It was just part of a worldwide programme of collection efforts that attempted to encircle the huge Soviet periphery along its Arctic landmass, the Baltic, the IGB down to the Adriatic over to the Black Sea and along the USSR's southern borders across to its Siberian seaboard. Many programmes were highly technologically advanced and nearly all used very specialised collection equipment. In and around Berlin, this relied on a combination of reconnaissance aircraft and ground listening stations. At that time Berlin was known as the 'spy capital' of the world, with both sides working hard to recruit potentially useful human sources. This only gradually eased after the 1961 erection of the Berlin Wall which halted the free movement of people between the two halves of the City.

In the Berlin Corridors, aerial surveillance was quietly stepped up and became more systematic with the use of visual intelligence collection and before long, the electronic signals intelligence (SIGINT). Although the cover soon wore thin, it was always asserted that the very regular flights into the City were necessary to supply Allied forces there. It was at least, partially true.

'Big Safari'

The Pentagon soon became renowned for its slow and complex bureaucracy. The Air Force identified a necessity to meet its sometimes urgent, operational needs that bypassed the 'quagmire' of Washington DC. From 1952, as the demand for special intelligence collection platforms and equipment items had ramped up across the US Air Force, Air Material Command took on the management of the most highly classified programmes. Although special 'one-off' aircraft modifications had been done before, 'Big Safari' as the USAF Project Office was soon codenamed, sought to establish simpler, common procedures to accelerate the whole process but keep it hidden under a heavy cloak of secrecy.

The USAF used a bewildering number of project and operation names connected with intelligence collection tasks. In the early years, most had comprised two words with some using female names.

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The ubiquitous C-47 was a valuable early reconnaissance platform. Its cameras hidden below the aircraft's passenger deck was said to make crew access to them difficult. (Ralf Manteufel)

Examples include 'Wanda Belle' and 'Nancy Rae'. Under 'Big Safari', the naming system soon became more formalised with the first word identifying the project's originating command. So 'Rivet' belonged to Air Force Logistics Command, 'Senior' to HQ USAF, 'Creek' to HQ USAFE and 'Comfy' to the USAF Security Service.

The modification programmes undertaken shared many similar characteristics. As well as mostly being urgent and using advanced technology, they were needed as one-off pieces or in very small quantities. Each project was generally paired with a selected contractor. They would then develop, install and test the required equipment. Most of the Cold War 'Big Safari' programmes were modifications to aircraft mainly engaged in peripheral intelligence collection, or special forces related activities. Once modified, the aircraft were regularly returned to the contractors when major maintenance was required or further modifications were necessary. The two were often scheduled together, which made sense but sometimes led to prolonged absences of aircraft from their assigned units and tasks. It was not unusual for individual airframes to pass through a facility several times over their lifespan, sometimes for maintenance and modification, but sometimes to be adapted for a wholly new mission. Many adapted airframes, when no longer required for 'Big Safari' related programmes, were 'de-modified' and passed back to regular military units.

Re-naming projects to suit the operational organisation of the day caused further confusion. For example, the SIGINT C-130A/B programmes 'Sun Valley' I and II, later became 'Rivet Victor'. There were other administrative changes and inconsistencies that all added, even if sometimes unintentionally, to the camouflage.[1] The modification work was split across several 'Detachments'. What became known as 'Detachment 1' was established at the General Dynamic Convair Division in Fort Worth in the 1950s. Every effort was made to keep the Detachments as inconspicuous as possible. Military personnel did not wear uniforms and there were no visitors, other than those formally approved by Washington or Air Material Command. Newly modified aircraft were often flown from the Detachment using their pilots to Wright-Patterson AFB so they did not know the aircraft's eventual operational destination. The aircraft were then collected by crews from the operational units.

Detachment 2 was set up at the Texas Engineering and Manufacturing Company (TEMCO) at Greenville in Texas in 1957. In 1961, then Ling-TEMCO electronics merged with Chance Vought and since has changed names several times via E-Systems, Raytheon, L-3 Communications and 'L3Harris', but the 'Big Safari' work continued. Established in 1968, Detachment 3 was the shortest-lived, run by Ryan Aeronautics at San Diego, primarily for the purchase of reconnaissance drones but it passed back to Air Force Systems Command's Aeronautical Systems Development in 1969. In its early stages, Detachment 4 became mainly involved in specialist C-123 and C-130 based modifications from approximately 1964. Originally based upon the Lockheed Aircraft Services company, it operated from facilities in Ontario, California. When the lease on that location expired, the facility transferred to the nearby Lockheed Palmdale 'Skunk Works'. Later, much of Detachment 4's work was moved to the L-3 Communications facility at Waco, Texas.

C-47 'Skytrain'

The ubiquitous C-47 was used by military services across the world from the Second World War and remained in widespread use into the 1970s. From 1948 up to their final withdrawal around 1960, up to eight C-47s were used on Corridor work. Some carried the markings of the 7167th Transport Squadron, then also based at Wiesbaden. In addition to the standard transport aircraft, some were capable of carrying camera installations hidden beneath their cargo hold floors and so could continue to transport cargo and passengers. Whilst this gave an appearance of 'respectability', crew access to the underfloor cameras was said to be difficult. The photographic fits identified for at least some of these aircraft consisted of a K-17 camera with a 12in lens and a vertically mounted K-22 and a 24in lens. Other fits included three K-17s with 12in lenses mounted in an overlapping fan arrangement giving horizon to horizon cover and able to produce stereoscopic images. The cameras produced 9×9in format frames although some reports have suggested the use of 9×18in format frames.

In those early years, visual reconnaissance was a common practice. Sergeant Fordham of the USAF Security Service described how in 1953, he was tasked with standing in for his boss, Lieutenant Pearsall, on the once-weekly, C-47 courier flight that carried locally collected SIGINT materials from Berlin to Wiesbaden. He explained how, after take-off from Tempelhof, he was invited up to the aircraft's flight deck. As the aircraft progressed along the Corridor he and the other flight crew members noted the numbers and types of aircraft at each airfield they passed. Although he had not been specifically briefed to do this, the aircraft flight crew had simply assumed he would do it, as Lieutenant Pearsall did whenever he was on the flight.[2]

Douglas C-54 'Skymaster'

The RB-17s engaged in Corridor work were gradually superseded from 1950 onwards by several C-54s in various SIGINT and camera-equipped (PHOTINT) configurations. They successfully operated from Wiesbaden flying a wide range of short and long term Corridor and peripheral tasks until they were replaced by the more modern C-97s.

USAF
U.S. AIR FORCE
0-17248

The C-54D codenamed 'Hot Pepper' was primarily a photographic platform and later, became the first significant SIGINT aircraft used on Corridor flights. (Ralf Manteufel)

C-54D 'Hot Pepper'

One of the very first 'Big Safari' modifications was to C-54D 43-17248, subsequently flown on both Corridor and peripheral collection missions. The aircraft had already been operating in Germany and sometime around 1949, is understood to have been fitted with one of the five K-30 cameras with a 100in lens that the US Air Force purchased and used 9x18in film. This was supplemented with the more familiar, three-camera fan arrangement that generated horizon to horizon coverage from altitude and could provide some stereoscopic imagery. From March to July 1954, the aircraft was with General Dynamics under 'Big Safari' arrangements and subsequently became codenamed 'Hot Pepper'. Records from that time detail that at least after this work, its K-30 was positioned directly behind the flight deck. An electrically powered mounting was used that permitted movement of the camera to take images from both sides of the aircraft. The lens was hidden behind 24x48in pneumatically operated doors that when closed, made it externally invisible. A single K-17 camera with a six-inch lens was also carried, fitted just behind the C-54's nosewheel housing.

After the fitting of additional equipment in September 1957, Hot Pepper could also carry some SIGINT equipment, although it remained primarily a photographic platform. Another round of modifications saw the installation of a removable, covert ELINT capability comprising an AN/APR-9 receiver, AN/ALA-5 pulse analyser and AN/ANQ-1A recorder. The displays and operator's position for this equipment were hidden by false cupboard fronts when not in use or when uncleared personnel were on the aircraft. The antennae for this equipment were fitted in a large AN/APS-23 radome under the forward part of the aircraft. However, it was only briefly used and was removed in late 1958 when another upgrade relocated the AN/APR-9 system antenna into the tail fin. This enabled removal of the obvious under-fuselage bulge and the aircraft again resembled a more standard cargo C-54D. Following withdrawal from USAFE, the platform was further modified and briefly served in SE Asia, said to be largely unsuccessfully, from March 1962 to February 1963, under the codename 'Hilo Hattie'.[3]

C-54D 'Pretty Girl'

Before their 'Pretty Girl' modifications in 1955, two C-54D airframes (42-72667 and 42-72465) flew from Wiesbaden with the 7499th Composite Squadron, from around mid-1951. Following work at Fort Worth in 1955, the 'Pretty Girl' aircraft were equipped for dedicated SIGINT operations. They replaced the last of the obsolete B-17s and were a major capability jump, although they appear mainly to have been tasked on peripheral missions.

The aircraft carried a crew of two pilots, two navigators, a crew chief, seven EWOs and an in-flight maintenance technician. Their main equipment included the AN/APR-2, an automatic rapid broadband scanner and a paper tape intercept recorder for morse and printer transmissions, plus AN/APR-4 and AN/APR-9 wideband search receivers. A direction-finding antenna was mounted in the aircraft's wingtip. Other antennae were mounted in under-fuselage blisters and one placed in the vertical tail fin. Six of the USAFSS EWOs worked positions that covered specific frequency ranges (with a recording capability) with the seventh used in a coordinators/supervisors role.

The extent to which 'Pretty Girl' was used in the Corridors is uncertain but we know a little more about some of their peripheral operations in Europe. For a very brief period, they even worked with the Yugoslavian armed forces while their country's relationship with the USSR was especially sour.[4] The external antenna blisters were replaced with flush fitting ones by 'Big Safari' in 1958 and in 1963, the aircraft were replaced by C-97s.[5]

C-54 'Lulu Belle'

C-54D 42-72684 joined the 7499th Support Squadron in December 1955 and remained until November 1962. It was initially modified to carry photographic and infrared equipment to support the Automatic Terrain Recognition and Navigation (ATRAN) programme. This

C-54 'SARA JANE'

Another of the many intriguing elements of aerial work around the Corridors and West Germany is Project 'Sara Jane' which utilised a VIP equipped C-54D and two C-54Es. Even today, the identities of the aircraft have not been revealed. The aircraft flew a covert role carrying very senior US administration, diplomatic and military officials to their destinations in VIP comfort. However, they were sometimes also expected to fulfil a very covert intelligence collection role. This was particularly the case for the monthly supply flights from Wiesbaden to the US Embassy in Moscow and probably, occasional other trips to other East European states and elsewhere in the Soviet Union and beyond.

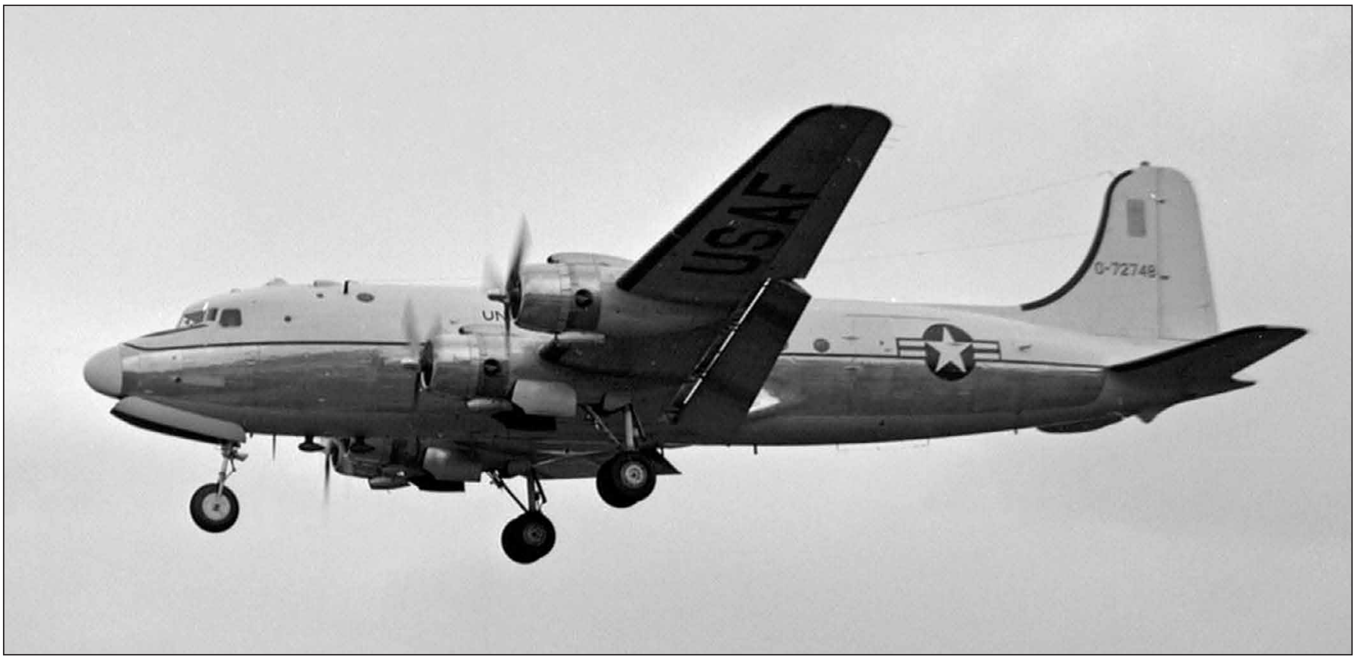
The three aircraft were converted between late May to November 1955 and fitted with 14 concealed Fairchild P2 cameras (which could be exchanged with panoramic cameras on two of them) installed in fuel-tight compartments in the wings and hidden by pneumatically operated doors. The cameras were operated discreetly from the flight deck via the co-pilot's AN/AIC interphone control panel, without any flight deck passengers necessarily even being aware of them. The controls required this high level of concealment because, particularly on flights to Moscow, the Soviets required the US to use a Russian navigator to accompany them on the flight deck, so any reconnaissance equipment used, had to be done so covertly. Later, the cabin windows at the navigator's and radio operator's positions were replaced with removable ones to enable hand-held photography with long lenses.[6]

One of the great characters of Cold War US aerial and space reconnaissance was Amrom Katz, who later worked for the RAND Corporation. In one of their 1951 project reports, he discussed some of the technical problems encountered in USAF photographic intelligence collection. In the last few pages of that study, he specifically addresses possible roles for the C-54 in photo-intelligence collection and even outlines the ideas that were built into the 'Sara Jane' aircraft just a few months later. Katz mentions he already had over 100 hours of experience taking images using hand-held cameras onboard unmodified C-54s which made him familiar with the aircraft type.

Discussing the monthly flights to Moscow, Katz pointed out one unintended consequence of the Soviet obsession with secrecy:

> It is understood in general that the Russian navigator flies the airplane on some sort of dog-leg route, which is not known to the American pilots and crew ahead of time; further the route is seldom the same from trip to trip … The change of route guarantees more coverage than possible from a fixed and oft-repeated route.[7]

All these internal modifications also had to be undiscoverable on the ground when Russian personnel turned the aircraft round in Moscow. Further, he also mentions the use of optically, internally stabilised binoculars by USAFE personnel on Corridor flights in Germany, which could sometimes be extended to use in the rear cabin of the C-54 flights to Moscow.[8]



Although not yet publicly identified, the 'Sara Jane' aircraft were modified for covert surveillance during embassy supply flights to Eastern Europe and the USSR. One of them is believed to be this VC-54D 42-72748 photographed on approach to Tempelhof. (Ralf Manteufel)

equipment was also carried by a small number of 'Half Track' RB-50Ds. It was used to create comparative imagery to enable accurately programming of the US TM-76B/MGM-13C nuclear cruise missile's onboard guidance system. The 'Lulu Belle' equipment installed included a stabilised 'thermal reconnaissance device', an APS-27 radar and the Goodyear AN/DPQ-4 ATRAN system.

The ATRAN fit on 'Lulu Belle' was probably a short-term arrangement pending the arrival of the specially modified RB-50Ds for the main part of the programme. Perhaps more likely, was that it could be flown in the Corridors without provoking an adverse Soviet reaction, whereas the RB-50s were specifically prohibited from doing so. Whilst the terrain and routing for the missiles in West Germany and close to the IGB and Corridors could be mapped accurately,

On final approach to Tempelhof AB, the four CT-29s worked undercover as the Berlin air courier service transporting a few passengers and small amounts of freight. (Peter Seeman)

Taxying at Tempelhof in 1965, inside the CT-29, cameras were hidden behind a false bulkhead wall towards the rear of the cabin and a cover on the underside of the aircraft. (Ralf Manteufel)

The gradual growth of the CT-29s all-up weight from increasing amounts of sensor equipment, resulted in them being unable to sustain level flight after an engine loss. As a result, this aircraft crashed a few miles from Wiesbaden on 9 February 1962 following an engine failure. (Ralf Manteufel)

once they were deeper into East Germany, the comparative filmstrip had to be created using sandbox terrain models. 'Lulu Belle' flew 43 ATRAN missions between December 1955 and autumn 1956 when the project was halted and the associated equipment later removed, perhaps as a result of the exposure of the programme to the press.

A 'Big Safari' visit from May 1957 saw the main ATRAN equipment removed, the retention of an infrared device, plus underfloor installation of the KC-1(the successor to the T-11) and versatile K-38 cameras, behind 'invisible' external doors. False bulkheads were fitted to hide the classified equipment from non-cleared passengers and observers. In 1958, an early datalink system was installed that enabled images to be transmitted from the aircraft to a suitable ground station, a remarkable technical feat for its time. By 1964, the aircraft had been retired to MASDC.[9]

Codename 'Carol Ann'

Another early 'Big Safari' programme was the conversion of four standard T-29 navigational training aircraft under the codename 'Carol Ann'. The airframes (49-1910, 1912, 1917 and 1933) were sent to General Dynamics at Fort Worth for modification between 19 March 1958 to 9 March 1959. The newly modified aircraft were transferred to Wiesbaden for the 7405th SS in 1959 finally replacing the last C-47s. Crewed by two pilots, a navigator and an observer, their cover was the familiar US Berlin air courier service. The inside of the CT-29s main cabin had been fitted with a small number of seats to add to its courier aircraft cover.

John Bessette flew as a navigator with the 7499th Support Group at Rhein-Main for two years from September 1963. He explained that once the CT-29s reconnaissance crew had boarded the aircraft, it would start engines and taxi over to the Rhein-Main AB operations area, near the control tower, to embark any passengers bound for Berlin. The aircraft loadmaster doubled as the 'flight attendant' for the passengers, giving them their take-off instructions and serving coffee on the short flight into Tempelhof. However, his main task was as an Airborne Observer, to look out of the two observation blisters on the side of the aircraft for targets of opportunity.[10]

The aircraft's reconnaissance equipment was hidden from the passengers in a separate compartment behind a false bulkhead towards the rear. There, the primary mission equipment, two KA-1

BERLIN'S LISTENING STATIONS

Throughout the Cold War, a large number of ground intercept sites were operated by the USAFSS, US Army, NSA, other US agencies plus the French and British in West Berlin and across West Germany. Some were used on a short-term basis, others remained for the duration of the Cold War. These included Marienfelde AS, RAF Gatow, the iconic Teufelsberg and Tempelhof airfield itself. Organisation and unit designations regularly changed as they worked to collect all forms of radio communication and electronic transmissions. Most of the facilities had a very wide role, with some capacity also dedicated to monitoring Russian and later, East German units listening in on the progress of Allied Corridor and BCZ flights. Urgent information about ongoing Soviet and East German activities and exercises collected by some of these sources, was sometimes fed via a secure line to the Corridor crews whilst they were on their stopover at Tempelhof and before their return to Rhein-Main. This enabled the crews to adjust their return route plan if new target opportunities had arisen.

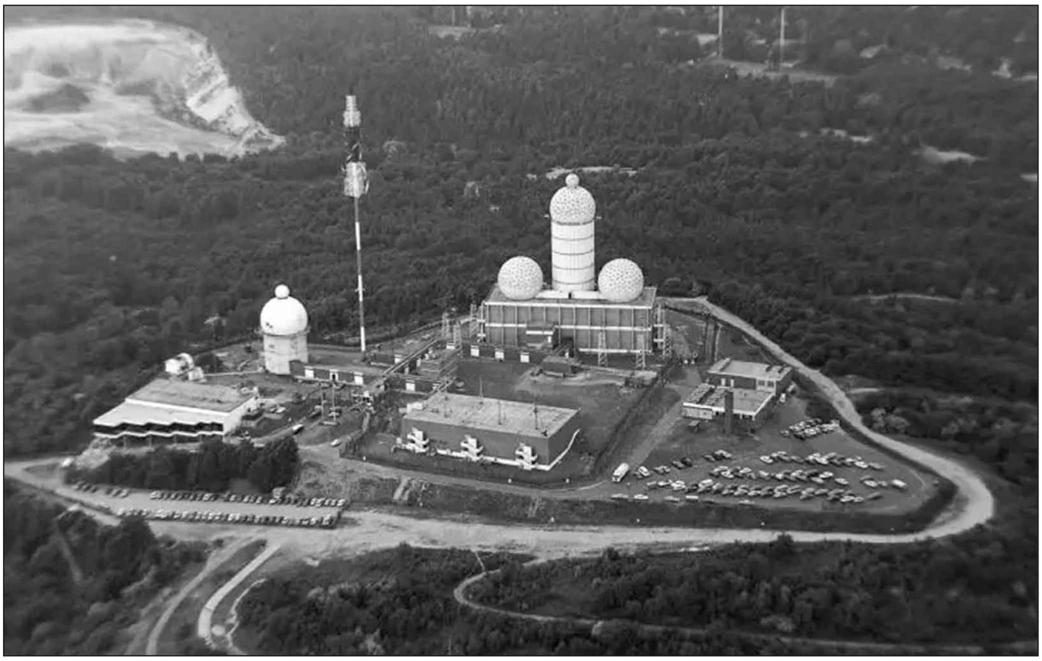
The role of the USAF Security Service (and its successor Electronic Security Command) often goes unreported, but its personnel were an integral part of Corridor related collection activities in the air and on the ground. The USAF Security Service was formed on 20 October 1948. It had begun operations in Europe at an early stage, formed out of elements from the Army Security Agency active during the blockade and airlift. Soon, direction-finding and morse intercept capabilities were put in place, followed by voice intercepts and the arrival of the first Russian linguists in early 1950. Detachment A at Rothwesten, Detachment B at Schleissheim, and Detachment C at Bremerhaven, were soon followed by what later became covertly known as Detachment D in West Berlin.

The best early account available of that period comes from then USAFSS Second Lieutenant Ken Pearsall with the 2nd Radio Squadron Mobile (RSM) and Virgil Fordham, a Russian linguist. In the summer of 1950, they were assigned to establish a facility to match real-time Soviet radar tracks with voice transmissions. Arriving at Tempelhof, they established their first makeshift facility in the Ops Centre (close to the BARTCC air traffic controllers working Corridor traffic) listening to Soviet HF transmissions. As Pearsall recollected of their initial test, 'As I had expected from my previous experience with radars and communications we hit a virtual gold mine. Sergeant Fordham was flabbergasted with what he was hearing. There was no doubt in our minds this was the place to set up an intercept site'.[14] Both men were then initially attached to Tempelhof's 7350th Air Base Complement Squadron.

Having proved the concept, they began to establish a more permanent facility soon returning with an antenna and more equipment. By 1951, they needed larger, more viable accommodation and were allocated a four-room secure space on the fifth floor of the control tower complex, close to the CPS-5 radar system. By 1955, the Detachment had grown into a 24-hour operation with two radar Planned Position Indicators (PPI) console positions and nine voice operator spots. They carried on collecting 'unique and significant SIGINT that was unavailable from other sources'. In January 1952, a direction-finding (DF) capability arrived at Tempelhof in the back of a C-82 transport. It was soon set up in a standard 'HO-17' hut near the end of one of the runways. Manned by a single operator on a 24-hour basis, their main task was to monitor Eastern HF radio beacons.

USAFSS operations from Tempelhof grew significantly from Lieutenant Pearsall's time as a Detachment in 1950 to become the 6912th RSM in July 1960. It was renumbered several times, as the 6912th Security Squadron in June 1963, as an Electronic Security Group in August 1979 and the 690th Electronic Security Wing in February 1988.[15] Members of the unit had also begun working from Marienfelde in 1962 and soon, Tefuelsberg. It operated on the upper floors of the airport terminal and members of the ASA also used the facility. In 1984, a 72-metre high tower was constructed at the eastern end of the terminal building for a new AN/FPS-117 radar system protected by an 'Igloo'. This high-quality L-band active electronically scanned array could monitor air traffic much further into Eastern Europe with its operators and specialists working in nearby buildings.

Teufelsberg, or in its English translation 'Devils Mountain', is perhaps the best known of these sites. Located in the British sector, the now derelict site sat on a huge mound built from rubble cleared from Berlin's many wartime bombsites. Construction of the mound started around 1946. Rising high above the rest of Berlin it was to make an ideal, if very obvious, listening post offering unrivalled reception. Known officially to the Americans as 'Field Station Berlin', in the early to mid-1960s, it consisted mainly



Built on top of a huge heap of rubble dumped there in the years following Second World War, Teufelsburg became one of Berlin's many Cold War icons. (NARA)

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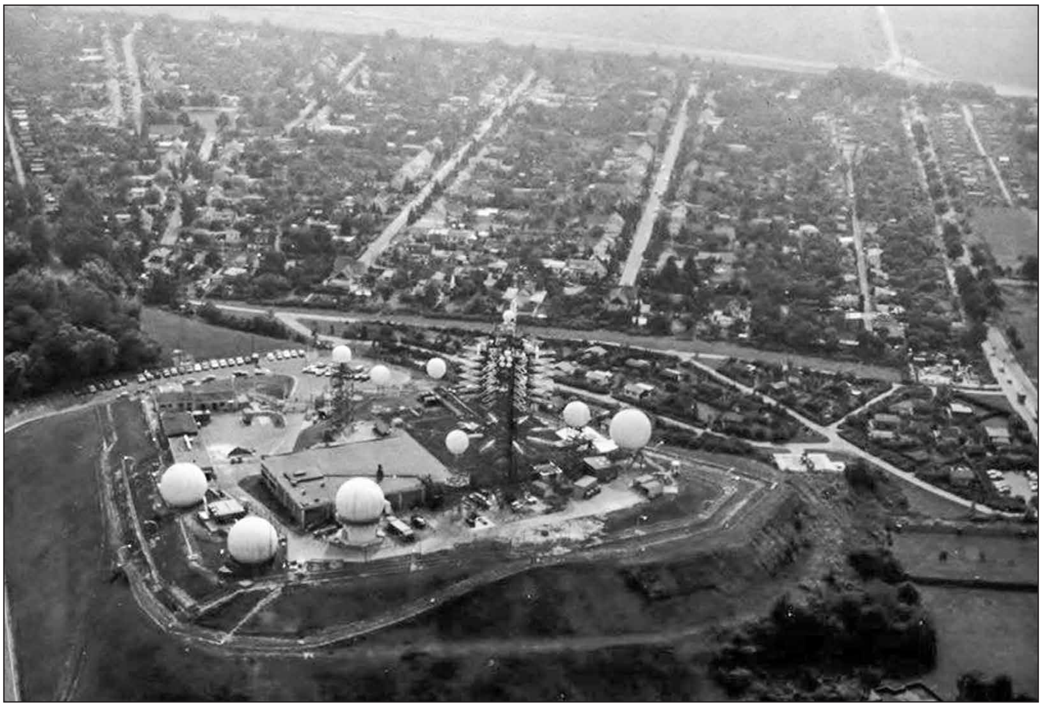


Marienfelde was built on a smaller rubble pile with a US and British presence able to listen in on Soviet and East German electronic transmissions. (NARA)

of portable and temporary buildings shared with the British. Planning for more permanent facilities began in 1968 and during 1972, a large two-storey operations building came into use for the British (Building 1455), soon overshadowed by the much larger, three-storey US operations facility (Building 1458), capped by three-antenna domes and soon, a 120-metre mast, that opened in the same year.

Managed by US forces, it housed around 1,000 US staff from the ASA, NSA and USAF, with another approximately 300 British Army (13 Signals Regiment), RAF (26 Signals Unit) and GCHQ personnel. It was able to intercept a wide range of voice and telecommunications traffic and other electronic transmissions. Much of the interception capacity was dedicated to monitoring the operation of the East German state. Sometimes, real-time intercepts helped understand serious incidents as they unfolded.[16]

Marienfelde was another major listening station constructed from 1962 to 1965 and operated by the USAFSS and its 6912th ESG at Tempelhof. It was in the US sector and again, built on a (much smaller) mound of wartime debris. The site consisted of six 'operations' and a further 10 support buildings. In addition to the USAFSS personnel, the British RAF also maintained a presence. It was an early location for the use of the very successful Watkins-Johnson WJ-8618B SIGINT receiver that had scan and memory facilities which soon entered widespread use.[17]

RAF Gatow was the British equivalent of Tempelhof for the Americans. It was a much smaller and quieter airfield from where the small number of British clandestine Corridor missions stopped over. It was also home to two RAF Chipmunk training aircraft used to undertake low-level flights around the BCZ and which achieved some remarkable photographic results. RAF Gatow had a significant SIGINT role, parenting the RAF's 26 Signals Unit and the British Army's 13 Signals Regiment. They provided a large part of the British element staff at Teufelsburg and other SIGINT collection locations.

Gatow's hangar four became the centre of SIGINT intelligence activities on the airfield in the 1960s. The construction of three towers for mounting interception equipment and a refurbishment programme saw the installation of recording equipment and associated Russian, Czech and German linguists and office accommodation. In 1983, installation of a new Plessey Type 94 radar provided a very modern system. Air traffic data from the RAF Gatow radar was integrated into the air picture provided by BARTCC. However, it also had a significant intelligence function able to see deep into Warsaw Pact territory. It was credited early on with monitoring the operations of Finow (Eberswalde) based Soviet MiG-25PDs (Foxbat E) that were configured to intercept USAF's SR-71A 'Blackbirds' as they engaged in missions over the Eastern Baltic and along the Inner German Border.[18]

cameras with 36in lenses were fitted in a roll stabilised mount. They simultaneously provided imagery beneath, to the right and left of the CT-29, producing 9x18in negatives. There was an additional floor mounted fan arrangement of three T-11 cameras with six-inch metrogen lenses.[11] This could be swapped out for infrared equipment when required.

The Fairchild T-11, produced between 1951 and 1954, was a major advance in mapping camera capability. When mounted in a fan arrangement they became a capable area reconnaissance tool. Indeed T-11 cameras were also fitted in the reconnaissance capsule produced for the early RB-52B. The camera carried up to 390ft of 9.5in wide film in an integral magazine. The camera also recorded details of exposure number, a title bubble, time clock and aircraft altitude. Camera vibration was reduced by a Type A-28 gyroscopically stabilised aerial camera mount. This was the first of a series of mounts designed to improve photographic resolution by decreasing aircraft vibration effects on the camera.[12]

The CT-29s rear compartment also held an operator console and contained film storage racks. The rear operator ensured the cameras were correctly aimed and that all the equipment functioned smoothly. The navigator's position behind the pilots was fitted with an A-17 viewfinder that looked out of the bottom of the aircraft and the T-29 used a remote autopilot to guide the aircraft during important parts of the photographic run when required. The observer's position contained a control to enable him to operate the camera doors.

From 1962, a partial shipping crate was used to cover a newly fitted, 40in lens equipped camera in the main cabin when the aircraft was on the ground or 'uncleared' passengers were being carried. In use, the camera could be swung across the fuselage to look out of the left or right side of the aircraft as required, shooting images through the aft escape hatch aperture. From 1963, their programme was renamed 'Ocean Gem'. Early poor maintenance of the aircraft before they joined the 7405th and the growing weight of mission equipment, posed increasing problems for these CT-29s. A serious wing corrosion problem was resolved by the replacement of the wing spars beginning in 1965. However, the gross weight of the aircraft had become a serious safety issue, such that the T-29 could not sustain level flight on a single engine. Aircraft 49-1917 had crashed at Breckenheim, a few miles from Wiesbaden on 9 February 1962 following an engine failure on take-off. Fortunately, the four crew escaped successfully and the wreck was later removed to the Wiesbaden fire dump after retrieval of all the classified equipment.

By August 1968, the three remaining aircraft had left the 7405th SS. They were modified again by 'Big Safari' and sent to Osan AB in South Korea under the name of 'Rivet Kite'. There, they operated in the SIGINT role with an automatic collection system, manned by the USAFSS and mainly engaged in operations aimed at the DPRK.[13]

The early 1960s saw a variety of aircraft types in use, however, it was the arrival of the C-97 Stratocruiser, that would bring a much greater degree of standardisation and made the lives of air and ground crew simpler. The increase in aircraft size also gave greater flexibility for changes to sensors and the number of operators that could be carried. This was especially true for electronic sensors.

3

BOEING C-97, HIDING IN PLAIN SIGHT 1963–75

Whilst the wartime era C-47s and C-54s soldiered on, newer transport aircraft were entering the USAF's inventory. The Boeing C-97 was one of those, even with its obvious origins as the B-29 strategic bomber. Boeing eventually built 888 C-97s in both tanker and transport versions and they became a common sight across Western Europe from the 1950s, well into the 1970s. Being familiar, looking innocuous, with a large cabin and hold spaces, it was readily adaptable to more covert uses.

One C-97A and 11 C-97Gs (converted from KC-97G models) were adapted for intelligence collection by the US Air Force.[1] Most were modified to unique configurations and became the mainstay of US Corridor (then Creek Flush) missions and some Far East operations from 1962 to 1975. All but two of the 11 converted C-97Gs eventually saw service in Europe with the 7405th.

Before the gradual rundown of the C-97 operations was completed in 1975, the 7405th had an average of five aircraft on strength with a mix of primarily SIGINT and photographic (PHOTINT) equipped airframes. The C-97s sensor fits were usually upgraded when they returned to the US for depot level maintenance with 'Big Safari'. As Staff Sergeant Bob Bregent explained:

> We flew across the pond on an almost monthly schedule back to Fort Worth, Texas so that General Dynamics could modify, or fix, or whatever in the hell they did on our aircraft. In winter, the route went via, RAF Mildenhall, onto the Azores to refuel again (and load up on Mateus Rose wine!) then via Andrews, Offut and finally Carswell AFB. In the summer it was via Keflavik AB, Iceland, Goose Bay, Canada and then down to Carswell. 7405th C-97s were occasionally swapped with airframes used by the 6091st SS at Yakota AB in Japan who did similar work to us.

Project 'Pie Face'

Perhaps the best known of the individual projects that used a C-97 was 'Pie Face'. Continuing from his Second World War career as a leader in aircraft photo-reconnaissance, General George Goddard, became a leading exponent of ideas to use very large telephoto lenses. This would enable them to see deep into denied territory whilst avoiding the dangers of overflying hostile territory. Goddard utilised the expertise of Harvard's Dr James Baker, then the world's foremost authority on large lens optical research. He worked in conjunction with what became the Boston University Optical Research Laboratory (BUORL), founded by Dr Duncan MacDonald to produce various advanced lenses for defence tasks including several models of a folded optic 240in lens for extremely long-range photography.[2] One version was ultimately mounted on converted C-97A 49-2592 to carry what became the giant K-42 camera with its 240in lens and which operated for some years from West Germany. This was the very first of Air Material Command's 'Big Safari' projects. The camera became known by some of its operators as 'Big Bertha'.

Gestation for 'Pie Face' began in 1948 and a considerable insight into the design and construction of this remarkable camera can be gained from looking through materials held by the Howard Gotlieb Archival Research Centre at Boston University.[3] Examination of a small archive relating to the K-42 contains some fascinating detail about the early stages of its design and construction. At the time of the author's visit in 2018 to look over this unique collection, it was merely boxed. Hopefully, one day it will all be properly catalogued. It is first listed on a 26 May 1950 record as an active BUORL project under Dr MacDonald. A further company project listing from 17 April 1951 describes it as 'Project 18'.

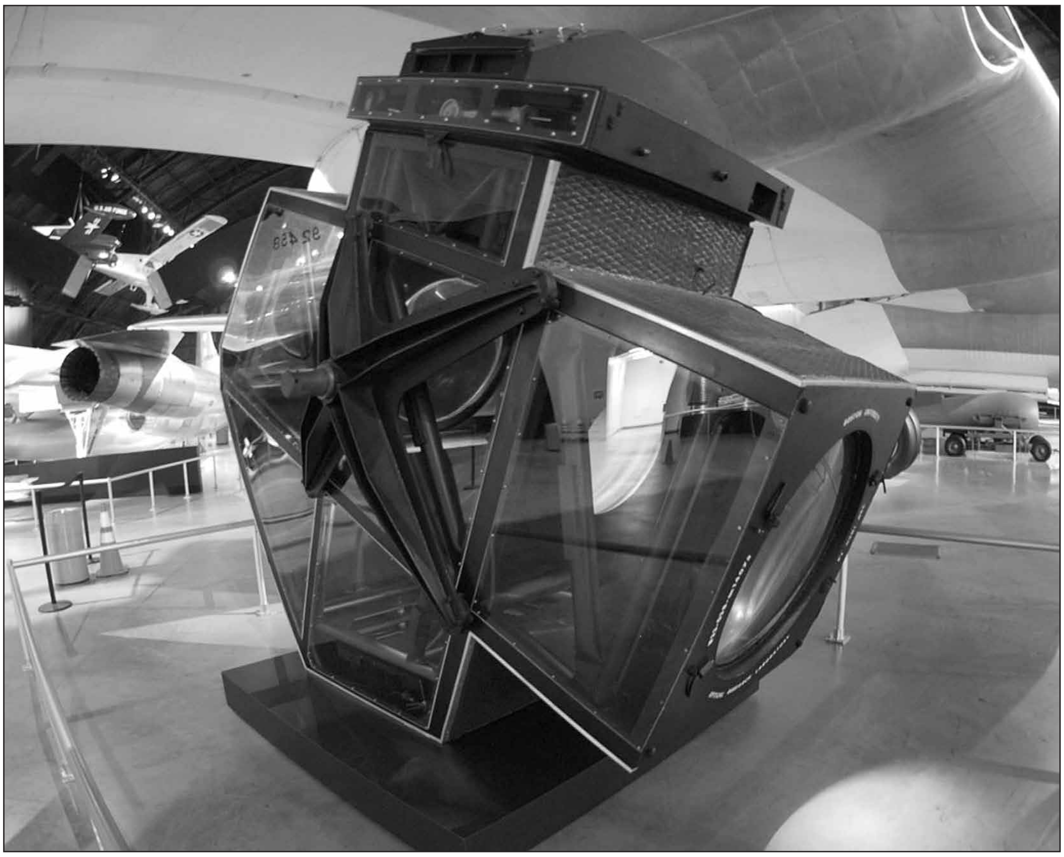
One note provides a breakdown of the camera's main design features and topics that needed to be solved for its successful use:

18a	Magazine including film travel
18b	The mirror
18c	Windows (through which the lens would be pointed to take images)
18d	Camera mounting and body
18e	Lens design
18f	Lens mounting investigation
18g	Mirror and lens coatings
18h	Film processing and printing
18i	Testing methods
18m	Accommodation to aircraft
18n	Laboratory testing
18o	Temperature control
18p	Viewfinder
18q	Construction of optics
18r	Special equipment

18s 'Little Boston'

Mention of 'Little Boston' refers to the design and construction of a one-fifth scale model of the 240in lens and camera. This took place alongside the main project and a detailed set of specifications and drawings still exists in the archive.[4]

Preparing to land on Runway 27 at Tempelhof, early C-97A 49-2592 carried the giant K-42 camera. The aircraft's rear Aerial Observers bubble is visible. (Ralf Manteufel)



The giant K-42 camera with its 240in lens saw project 'Pie Face' become probably, the most ambitious aircraft mounted long-range photographic effort of its time. Although the aircraft was scrapped long ago, the camera is now displayed at the USAF Museum. (USAF Museum)

Built within the BUORL facility at Boston University, the completed camera was taken to nearby Hanscom Field for onward transport. A complete set of high-quality photographs illustrates its transport from the University. This started from the street that runs directly outside the main University buildings in Boston on Commonwealth Avenue, wrapped in a protective blanket, loaded onto a flatbed truck and covered with tarpaulins.[5] Once at Hansom AFB, it was loaded onto a C-124 and flown to the Convair plant at Fort Worth in Texas, to come within 'Big Safari'. There it was installed in RB-36D 44-92088, sometimes described as an ERB-36D. The aircraft's structural 'I' beam had to be heavily modified to accommodate the camera and its mount. After its installation, new stiffeners were added to strengthen the fuselage again. Camera installation and early testing took place from Fort Worth between 6 January and 16 June 1951.[6] Another complete set of images shows the finishing stages of a very neat installation into the RB-36. Externally visible on the outer edge of the lens barrel, there was even a 'Boston University' inscription.

In 1989, Grant Ross, one of two BUORL staff involved in the camera's installation and testing onboard the RB-36, outlined some key details of the process. He says that in addition to the 240in, a 60in Perkin Elmer lens was installed with a K-30 camera at the same time. A 'Dove prism' was fitted under the aircraft, perhaps just for test purposes, which required a protective housing around it. 'Big Bertha' was installed at a 15-degree depression angle and for photography, the RB-36 was steered by the navigator to enable him to get his targets in the centre of images, which he indicates was some 35 miles distant at 40,000 feet.

Both Ross and his colleague, Jim Regis, took part in the flight test programme conducted from Fort Worth. Ross wrote that the process was very slow, mainly because the RB-36 took 'a long time to get airborne due to weather and technical issues'. He says that once airborne, it was often more efficient to undertake a large number of tests in one sortie rather than conduct them over several shorter flights. He stated that one such flight lasted over 20 hours!

The RB-36 and its new camera were subsequently briefly deployed to Europe for testing. The use of such a gigantic and unmanoeuvrable aircraft was always going to be problematic and made it largely unsuitable for European operations. It has most frequently been described as being simply 'too provocative' for operational use in the theatre. A peripheral flight, using a large bomber flying down the IGB would, initially at least, be regarded as provocative. Even with a useful camera range of around 35 miles at 40,000ft, the number of useful targets in range would be limited. As a ‘combat type’, the massive bomber was not permitted to fly in the Berlin Corridors. The B-36s difficult handling qualities may also have been an additional negative factor. The airframe was scrapped at Kelly AFB in 1955.

A March 1952 memo from USAF Chief of Staff Vandenburg to USAFE commander General Norstad, suggested the K-42 would be better installed in a C-124 or C-97 aircraft. He offered an early development YC-97 airframe, which was being underutilised because of ‘maintenance issues and a shortage of spare parts’.[7] Thus the camera was removed from the RB-36D and in the summer of 1952, transported by C-124 to Fairchild AFB in Seattle for installation to a YC-97 there. The K-42 then went to Europe again and operated ‘experimentally’ for six weeks from Rhein-Main using a fixed oblique mode, where it was flown by Major Carl Norman of the Special Air Mission unit there. Although the airframe’s performance was poor compared to the more powerful KC-97s then being built, the trial proved the camera’s value.[8]

From 19 December 1952 to 23 February 1953 at Fort Worth, the camera was removed from the YC-97 and transferred to C-97A 49-2592, previously used for early refuelling boom trials and assigned to the 7499th Support Squadron in the summer of 1953. The unique camera fit was installed in the cargo compartment, just forward of the wings, the design was over six feet tall and weighed around 6,500 pounds, reputedly the largest airborne camera ever built. It was fitted in a left-facing oblique mount. The K-42 produced enormous 36x18in negatives, which were christened ‘Texas postcards’ by some of the Photographic Interpreters.[9] In addition to the 240in K42 ‘Big Item’,[10] the aircraft the aircraft carried a Hycon K-30 with its 100in lens weighing 665 pounds in a left-facing oblique mount generating 9x18in negatives.[11] Three left looking K-17s, with 6in lenses were also fitted. These latter cameras were synchronised to operate with the ‘Big Item’. Once the cross-decking installation was complete the camera compartment could only be reached through a floor hatch in the main cabin which caused problems with the loading and unloading of film and maintenance. The two large cameras were aimed from the camera operator’s position on the flight deck using a slaved sight.

In the early days, there were difficulties with the camera’s fabric shutter design until it was replaced by a pneumatically driven solid shutter.[12] There have long been anecdotal reports that the enormous 240in lens experienced major focusing problems. Examination of a few negatives and printed images, held by the BU archive, for which the 240in lens was attached to a K-18 camera, appear to bear that assertion out. The central part of these images are well focused, but features become increasingly blurred as you look towards their edges.

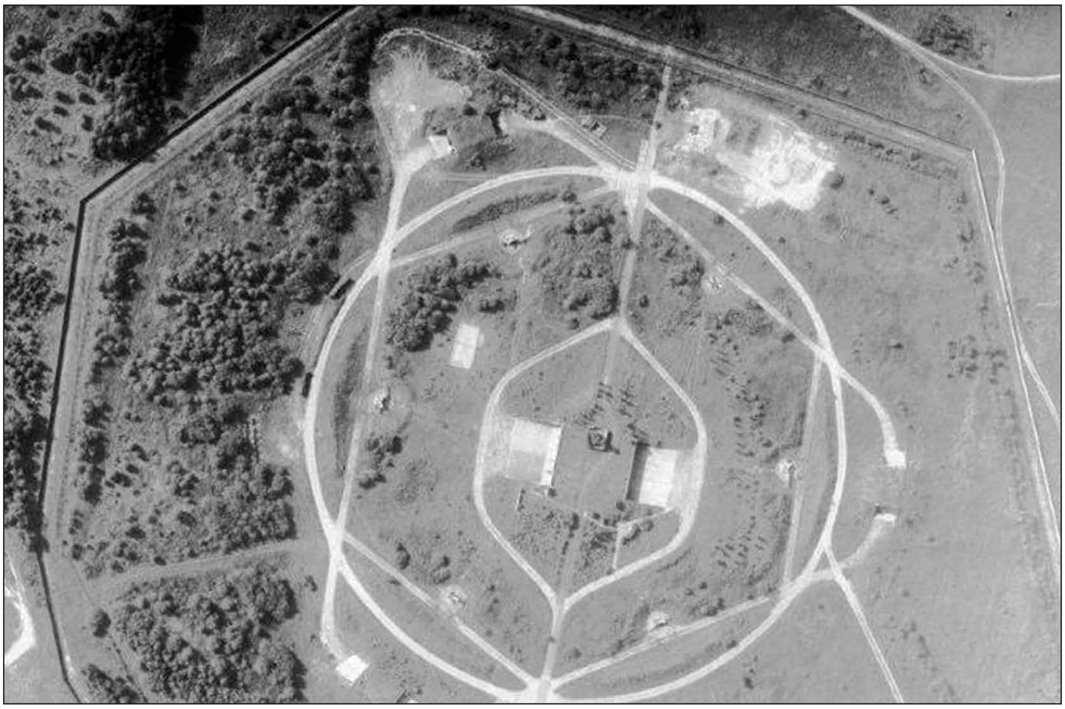
Although many praised Pie Face’s operational performance, there were critics too. Photo Interpreter Dino Brugioni recalled that the camera was: ‘plagued with problems that caused it to vibrate and produce smearing on the newspaper size images so that photo interpreters would see several smeared frames and then several clear ones’.[13] The short runway at Wiesbaden AB meant that the ‘Pie Face’ C-97A had to operate from Rhein-Main, where it became ‘Detachment 1, 7499th Support Squadron’.

The camera’s best results were achieved from around 30,000ft but this was not possible in the Corridors with their 10,000ft upper limit and where the often unsuitable North-West European weather conditions further reduced its utility. Nevertheless ‘Pie Face’ was used on around 12 Corridor and peripheral flights per month.[14] On the peripheral missions, the optimal 30-32,000ft bracket was a more usual operating altitude. An April 1955 CIA document reveals a refinement introduced to the 240in lens that added titling of individual images to be identified by mission number, time and the depression angle of the camera.[15] In 1962, retired from Europe, ‘Pie Face’ had a brief reprieve during the Cuban missile crisis when it flew from McDill AFB, Florida on at least 17 missions. Finally retired in 1965 to the MASDC boneyard, the camera was saved and is now displayed in the Wright-Patterson Air Force Museum.[16]

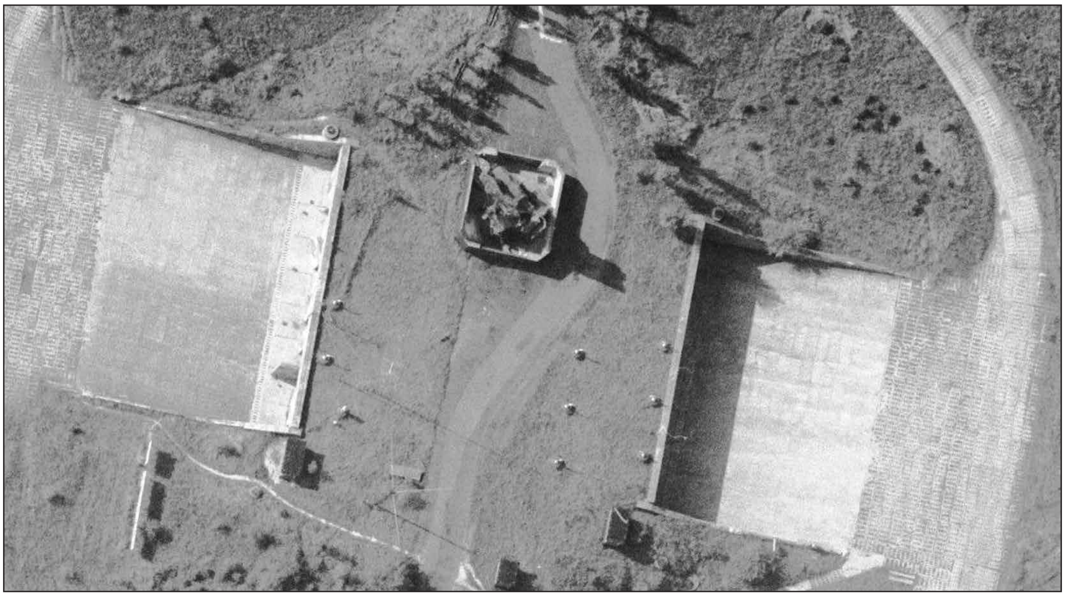
With hundreds of targets observable from the Corridors and BCZ, there was always something going on. This hit particular peaks during the exercise season and the annual Soviet conscript troop rotations. As well as the routine planned tasks, there were also two types of ‘specials’. The rarest, ‘Priority A’ Mission required that an aircraft launch against the target immediately, unless flight safety issues were involved. ‘Priority B’ specials did not require a special launch but took precedence over other mission targets as they flew the Corridor.

SAM Hunting

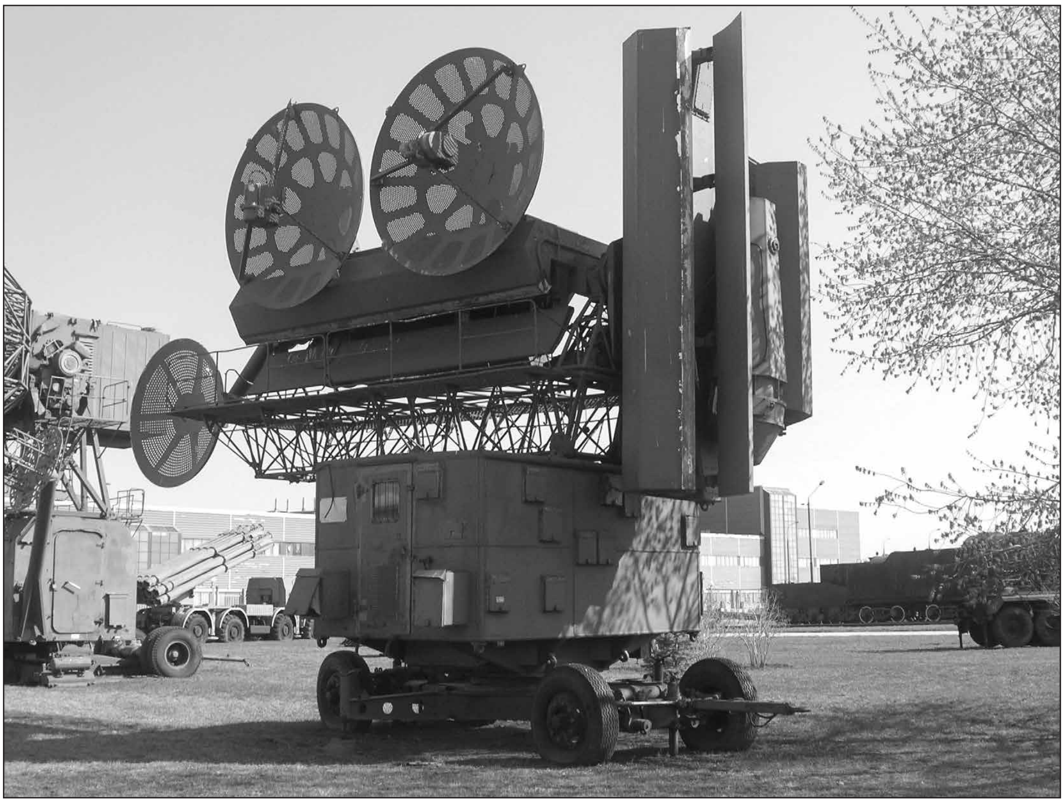
The SA-2 ‘Guideline’ SAM became a high priority for the US intelligence community in the 1950s. The system was initially most accessible to the Allies close to the Berlin Corridors with the construction of an early site at Glau, southwest of the City in



A SAM-2 site, with its distinctive layout, was first detected close to the Southern Corridor near Glau in 1957. This image comes from an upgraded East German site at Dietersdorf in Saxony-Anhalt in the 1980s. (Crown Copyright via Medmenham Collection)



The East German SA-2/S-75 SAM site at Dietersdorf (FRA-5121) was under the Southern Corridor and was part of the 51st Anti-Aircraft Missile Brigade (51 *FlaRaketenbrigade*). Its essential SNR-75 'Fan Song' radar was positioned on the roof of a hardened storage area. (Crown Copyright via Medmenham Collection)



A trailer mounted SA-2 'Fan Song' missile control radar displayed at the Avto VAZ Museum, Togliatti. (Wikimedia, ShinePhantom)

1957. There they posed a potentially lethal threat to all air traffic in the Corridors and BCZ. The site was first photographed by an unidentified Corridor mission. In what soon became a clear visual cue to the presence of SA-2 sites across the world, it consisted of six emplacements circling a single large central one. Even during the early stages of construction, it was well camouflaged and a high level of security was evident. The Allied photographic interpretation units' initial evaluations believed it to be a new type of heavy anti-aircraft gun site. As construction work proceeded, this assessment looked less likely and it was reclassified as an SA-2 site.

Its proximity to the Corridor presented a unique opportunity to gather intelligence on this state-of-the-art Soviet missile system that included the missiles themselves, plus their all-important target acquisition and fire control radars, firing unit and support equipment. AMLMs ground tours, Corridor and BCZ photographic flights and ELINT collectors all targeted the area.[17] The airborne collection flight was made a little easier because it was on the edge of the BCZ. In particular, an RAF Gatow based Chipmunk trainer soon provided detailed, close-up images of the site and equipment from which technical drawings were compiled and the system's *modus operandi* ascertained.

On 16 July 1959, Wing Commander Hans Neubroch with Squadron Leader Harry Nunwick, a specialist electronics officer – as his observer – headed for the site. They followed a standard flight profile until they closed on the installation when they quickly dropped to just 300ft. Able to use trees to partially conceal their approach they circled over the target twice so that Nunwick could take photographs with a hand-held camera before they returned to Gatow. The flight was regarded as an outstanding success. The following day, the images were with C-in-C RAF Germany and copies passed to the 497th RTS rapidly reached Washington.[18]

Surface Air Missiles were a growing threat to all Allied aircraft but the SA-2 posed a particular challenge to the CIA's ongoing U-2 overflight programme. Well known CIA Photo Interpreter Dino Brugioni has described how an umbrella of SA-2 sites covered major Russian metropolitan centres and by 1959, had been deployed to cover strategic targets deep into the Urals and Siberia. Barrier lines had also been created to protect strategic targets in the Baltic and Caucasus areas. Whilst the photographic intelligence was important, details of the SA-2 system's electronic signatures were perhaps, even more crucial.

Precision Parameter Measurements System

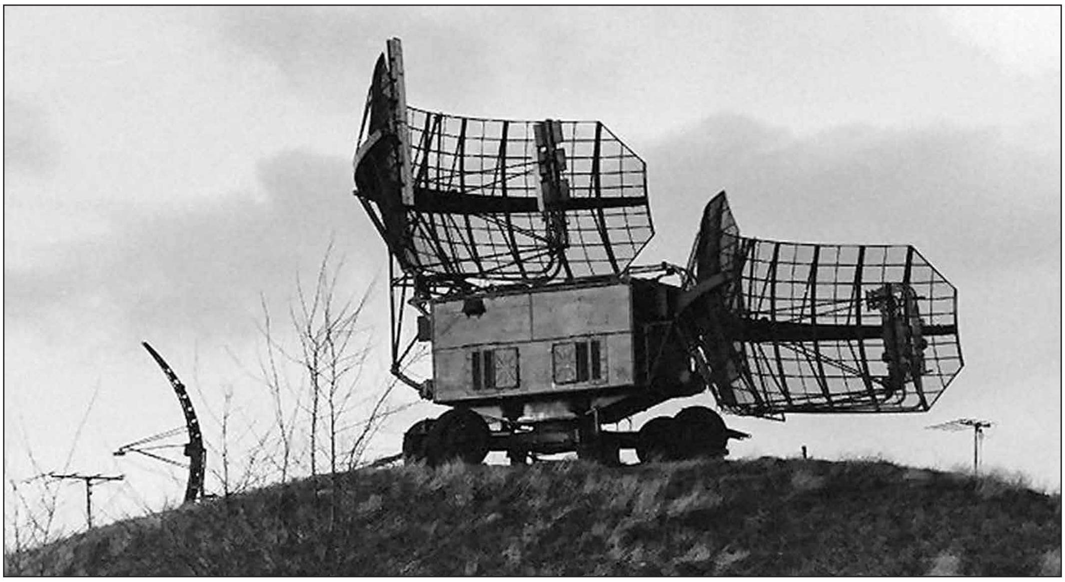
As well as locating the position of ground-based radars by DF and establishing the radar type in use, there was lots of useful intelligence to be gleaned by making 'precision parameter measurements'. This generally involved determining the characteristics of a radar's signal to a very high order of accuracy. These helped establish features of its operation and reveal its detection and tracking capabilities. This intelligence helped the development of effective electronic countermeasures.

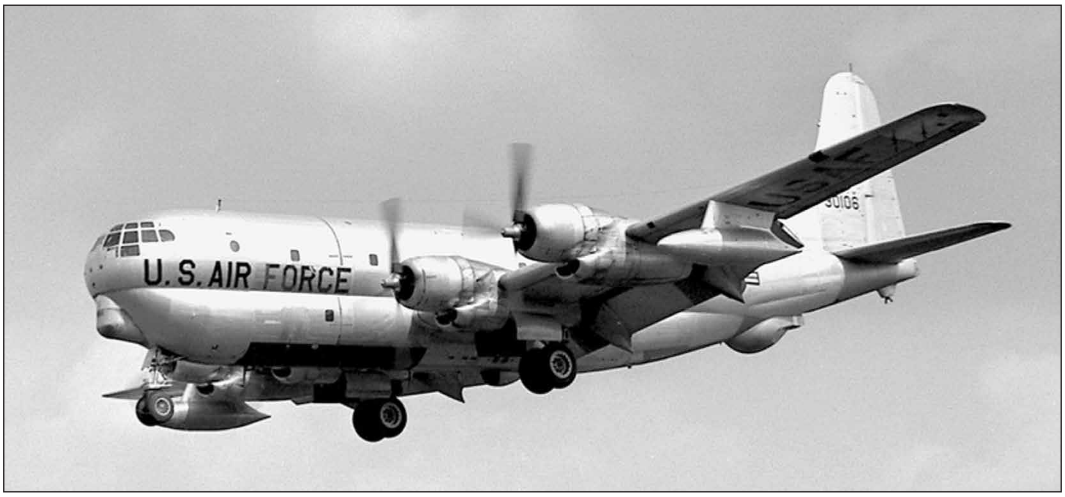
Large scale research programmes begun in 1957 and led by the CIA, helped develop specialist receivers and recording equipment to assist the countermeasures work. It also helped establish detailed radar signal threat libraries that became such an important element of specialist intelligence collection. The first major attempt to collect and measure the power of a radar system was an early Soviet 'Bar Lock' radar, a new E-band system that had been deployed close to Berlin by 1959. It was a location from where the radar's data could most easily be collected. For the task, the CIA worked in close conjunction with the USAF, using one of their aircraft to carry this specialised detection equipment.

The Agency's interest in the system was intense due to its ongoing U-2 overflights programme of the USSR. It was making considerable efforts to try and keep ahead of Soviet SAM capabilities. Early power output estimates of 'Bar Lock' were based on photographic images that put it as high as 5Mw peak pulse power from each of its five transmitters. This would have given it 10 times the power of older, similar Soviet radar types and significantly improved detection and tracking capabilities.

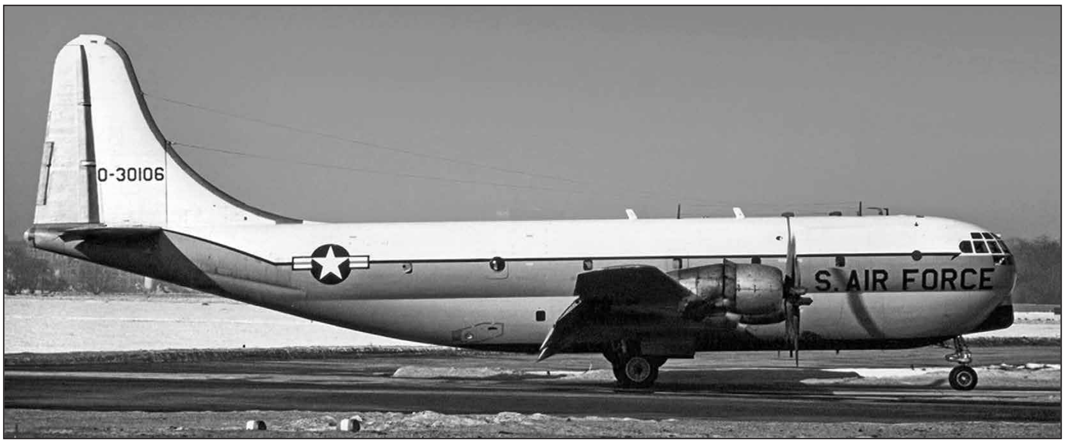
A hastily assembled set of power measurement equipment, comparatively crude by later standards, was installed in the cargo bay of a C-119 Boxcar and deployed to West Germany during the summer of 1958. From there, it made a series of flights through the Berlin Corridors and easily intercepted the 'Bar Lock' signals. Although the results were not highly accurate, they did indicate a peak power measurement of somewhat less than one megawatt for each transmitter – much lower than earlier estimates. This ad hoc collection arrangement paved the way for further research and equipment improvements, many of which were built into the later, 'Wine Sap' C-97G and other platforms.

In 1962–63, the CIA's Office of ELINT expanded its research programme of precision measurements to continue the work on

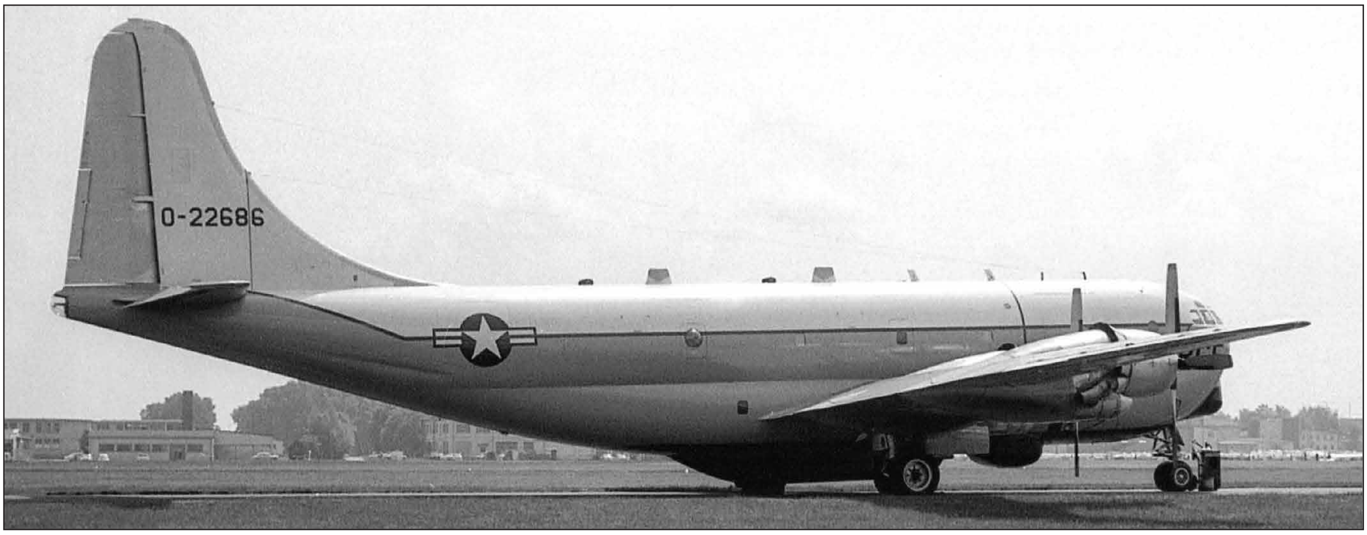

In the late-1950s, the CIA pushed forward the Precision Parameter Measurements System to measure the power outputs and major characteristics of Soviet radars at the time, like the P-30 and later P-35 'Bar Lock' E/F Band early warning radars that were deployed close to the Corridors. (US Army)



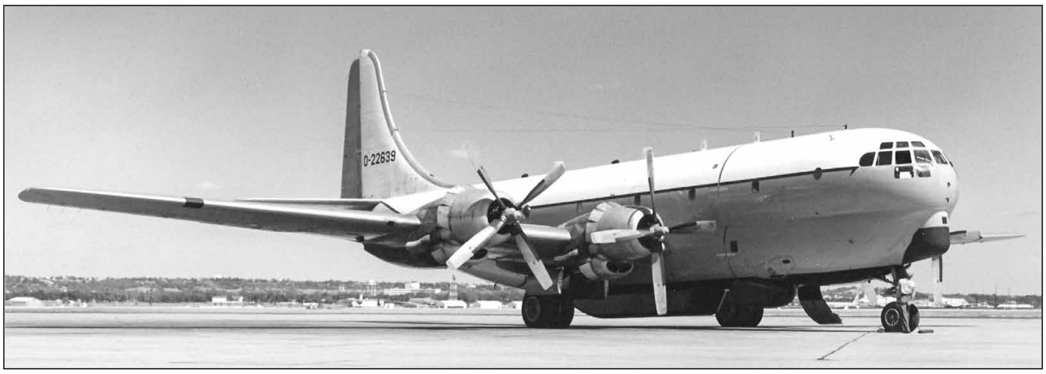
Seen on final approach to Runway 27 at Tempelhof in 1963, the 'Wine Sap' codenamed C-97 was in regular Corridor use up to January 1975. During its career, the aircraft was briefly deployed to the SE Asian theatre to collect data on Vietnamese SAMs. (Ralf Manteufel)



The 'Wine Sap' C-97G taxying at Tempelhof for departure. By the date of this shot in February 1969, its equipment was intended to collect data on later generations of Soviet SAMs. (Rainer Haufschild via Neil Aird)



A rare shot of C-97G 22686 at Wiesbaden with its obvious under-fuselage ELINT 'canoe' and fuselage top aerials meant it was restricted to flying peripheral missions. (USAF)



Photographed at Wiesbaden in 1965, 22639 with its distinctive ventral ELINT canoes. It was widely engaged on missions mainly into the Adriatic and Mediterranean. (USAF)

Of all the C-97Gs that operated from Wiesbaden, least is known about two that were exclusively engaged in non-Corridor operations. These were the SIGINT configured C-97Gs (52-2639 and 52-2686) used exclusively on peripheral intelligence gathering missions. Their very distinctive under-fuselage ELINT 'canoes' were just too obvious to plausibly claim they were transport aircraft for Berlin re-supply operations. Instead, they flew wide-ranging peripheral missions, often down the Inner German Border (IGB) and the eastern end of the Baltic. Heading towards sunnier climates, they periodically ventured down into the Adriatic, Black Sea and the Mediterranean on collection missions.

C-97G 52-2639 codenamed 'Little Guy', was at Fort Worth for a year from 22 March 1962 to 25 April 1963 being configured for its new role. It arrived at Wiesbaden shortly after work was completed and soon commenced regular operations. On its 10 seat main operator deck, eight positions were assigned to ELINT operators. After depot level work from January to June 1969, it was renamed 'Rivet Gumbo' reflecting a re-naming directive. In 1970, it returned to the US and after one month at Fort Worth, it was passed to Israel.[20] Its companion, 52-2686 served a brief period configured to intercept Cuban TV broadcasts. It then operated into Berlin for a short time and after further modification, moved to Wiesbaden, probably in 1962, under the codename 'Small Fry' and is understood to be configured similarly to 52-2639. In December 1969, it went to MASDC, to be transferred to 'another agency' in May 1971. Having been transferred to the Israeli Defence Forces, 52-2639 was brought down over the Sinai by Egyptian SA-2s on 17 September 1971 whilst on a reconnaissance mission.

Staff Sergeant Bob Bregent was an Aerial Observer/Load Master with the 7405th from 1968 to 1971. On occasion, he flew onboard the ELINT aircraft for some of their long missions into the Baltic and Black Sea. There could be as many as 15 people on the aircraft. As he explained:

> Every now and again we acted as Aerial Observers on these 13 to 14 hour missions where we flew at 40,000ft for some of the time. The C-97's pressurisation system could not cope with such altitudes so we had to use oxygen masks and 'pressure breathe' for the entire time …When you have to push out every single breath for three hours you feel like you are going to die and it was bloody freezing at that altitude too. There were air hoses that pumped out warm air into the cabin at floor level. We would take these air hoses and push the end up the leg of our flight suits and duct tape them in place just so we could get some warmth.

For some years during the 1960s, one mission series regularly flown by the C-97s from Rhein-Main, was a monthly flight down the Adriatic to land in Greece. It remained in international airspace at some distance from the coast and as it passed opposite the Yugoslav coast, it gathered whatever photographic and signals intelligence it could and then returned a few days later. Another high priority target was the Albanian naval base at Pashaliman and other military facilities around Valone Bay where Soviet submarines were based until 1961. After examining material from a year's missions – 24 passes of the target area – only one had produced any imagery and even this was of only marginal value. As a result, HQ USAFE decided to cancel such regular flights as they felt the missions were not delivering useful results.

establishing the vulnerability of its U-2 and A-12 systems and to improve their electronic countermeasure equipment. That research had a much wider relevance, particularly for Air Force and Navy crews likely to encounter Soviet radar and air defences in a wartime situation.

Following further modification work and testing of new PPMS equipment, C-97G 53-0106 began operations under a project codenamed 'Field Day'. It was also fitted with a vertical T-11 camera to enable the aircraft's progress to be correlated with the emitter data. Later, some further unspecified ELINT equipment was installed. Between July and September 1963, the aircraft undertook operational work against Cuba and in West Germany, targeting Fan Song radars. It returned to Germany from May to September 1964, this time under the project name 'Wine Sap I' to again work against 'Fan Song' radar variants. After further 'Big Safari' modification at Fort Worth in February 1965, it returned to Germany for 'Wine Sap II', until sometime in August to target Soviet 'Flat Face' surveillance/target acquisition radars.

As well as its European operations the aircraft was also deployed to Clark AFB in the Philippines for similar work against North Vietnamese emitters. A C-97, almost certainly the same aircraft, also took part in other PPMS operations along the Corridors using code names: 'Cross Field' and 'Top Hat' from May to October 1966. The first series was aimed at 'Fan Song' C and E radars, the second at 'Bar Lock', 'Big Mesh', 'Side Net' and 'Fan Song' again. After a 1967–68 equipment refit, the aircraft was re-titled 'Rivet Stock'. It stayed with 7405th SS until 1975, by which time it was monitoring radars associated with the SA-4 'Ganef' system.[19] It was one of the last C-97s to operate with the 7405th SS and it was retired to MASDC on 29 January 1975 and declared 'excess' on 22 May 1975.

Other Corridor C-97s

Another of the photographic priority aircraft was 52-2688 codenamed 'Eager Beaver'. It was modified at Fort Worth from 17 July 1963 and returned to USAFE, arriving with the 7405th SS later that same month. The main camera was gyro-stabilised and fitted with an oblique mounted 66in lens, plus a KA-1 with a 12/24in lens and KA-2 also with a 12in lens. They both produced 9x18in

0-22688
U.S. AIR FORCE

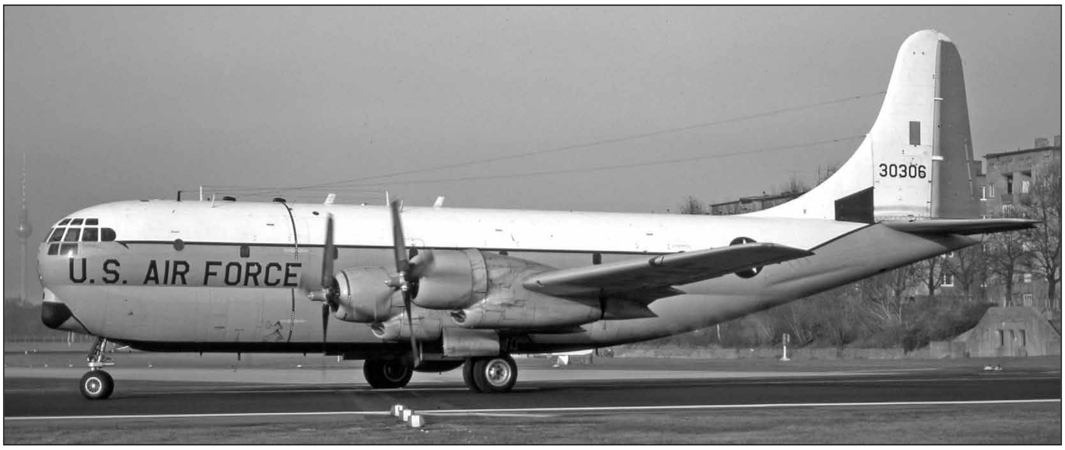
Light snow coverage at Tempelhof provides a photogenic backdrop to 'Eager Beaver' C-97G 52-2688. The aircraft was retired from service in late 1969. (Peter Seeman)

USAF
0-22688
U.S. AIR FORCE

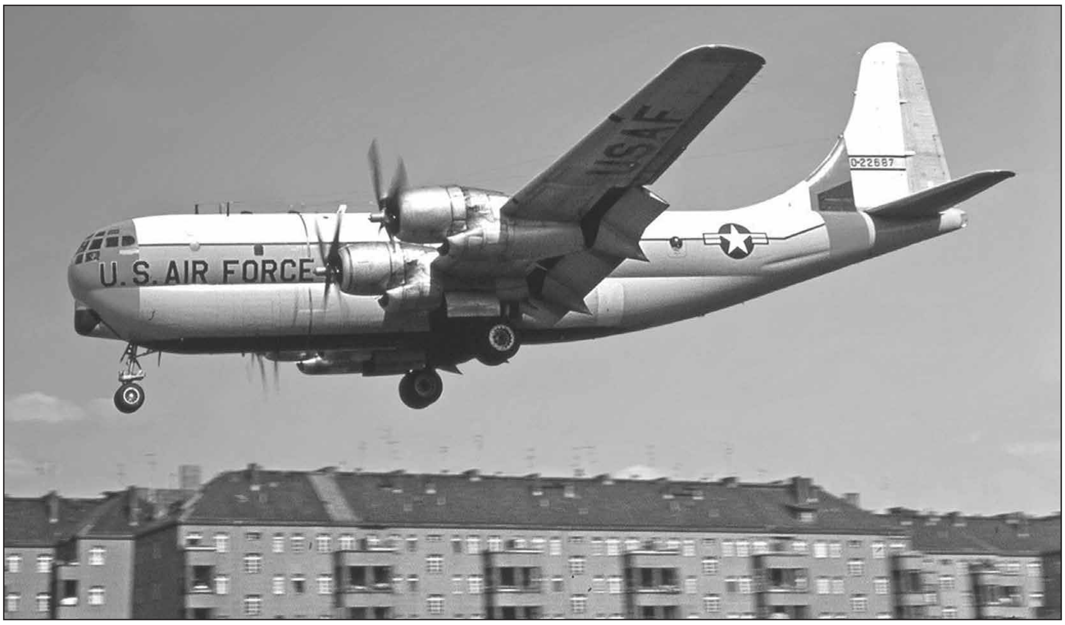
Final approach for 'Eager Beaver' C-97G. The aircraft was equipped with a wide range of cameras for Corridor missions. (Ralf Manteufel)

0-22724
U.S. AIR FORCE

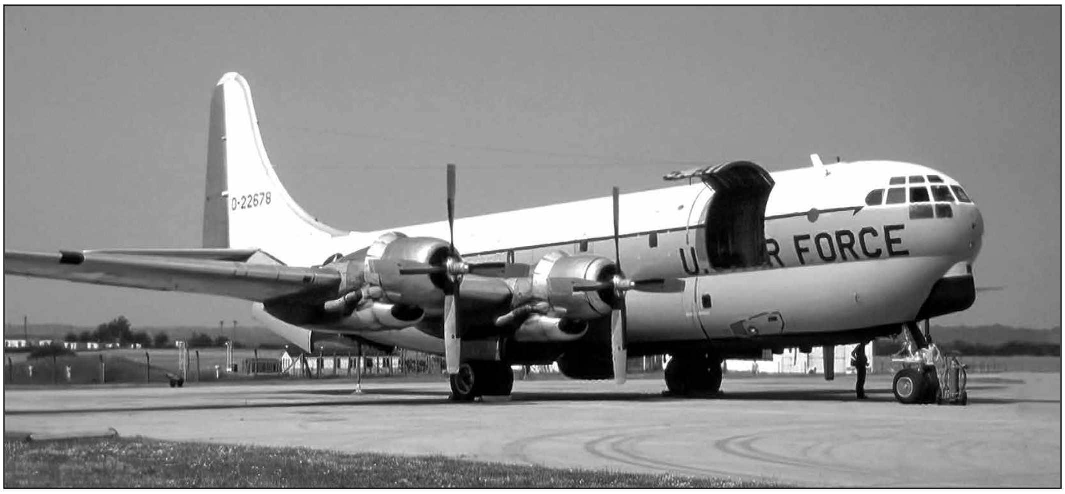
Exiting Runway 09 at Tempelhof, the 'Side Kick' C-97G at one time carried a camera with a 100in lens and was briefly deployed to the Pacific theatre. After depot modification in 1969, it became 'Rivet Giant'. (Ralf Manteufel)



'Rivet Flare' was a regular visitor to Tempelhof. It joined the 7405th in the latter half of its career and was one of the last C-97s to be used on Corridor missions. (Ralf Manteufel)



In the early part of its career 'Flint Stone' was a mixed photo and ELINT platform and for a brief period was deployed to the Belgian Congo on missions required by the CIA. During depot level work in 1969, the ELINT positions were removed. It was the last C-97 to leave Wiesbaden on 18 December 1975. (Ralf Manteufel)



'Rivet Tub' was devoid of special mission equipment and was used by the 7405th as a front end crew trainer and so could be opened up for public viewing, seen here at RAF Upper Heyford open Day in June 1969. (Don Gilham)

negatives that were the same cameras used by the RF-101A Voodoo reconnaissance aircraft. After a stay at Fort Worth between January to June 1967, 'Eager Beaver' returned to Germany with a Fairchild KS-96A panoramic camera and an RS-10 infrared, plus the new name 'Rivet Box'. In late 1969, the aircraft left Germany for de-modification at Tinker AFB and was declared surplus there on 13 October 1969 and sent to MASDC at Davis Monthan AFB on 17 February 1970.[21]

C-97G 52–2724 was modified under the name 'Side Kick' and first deployed to Europe, temporarily, in October 1961. It was properly assigned to the 7405th SS in June 1962, returned to the USA again in August 1963 for depot level maintenance and further upgrade work. It then moved to the Pacific theatre, including a period fitted with a camera and 100in lens until 1968. In September 1969, it returned to Wiesbaden, now equipped with a KA-81A camera fitted with a 48in lens and a KA-82A with a 12in lens, as well as an RS-10 infrared camera and the new name 'Rivet Giant'. Awaiting imminent replacement by 'new' C-130s it arrived at MASDC on 25 April 1975 and was declared as 'excess' the following month on 22 May 1975.[22]

The 'Cindy Fay' C-97G (53–0306) aircraft had been modified from late 1965 to early 1966 and moved to join PACAF's 91st SRW as a support cargo/trainer aircraft. Following a return to the depot from June 1968 to 19 April 1969, it emerged fitted out for photographic operations. Its new equipment included an oblique mounted camera with a 48in lens and a 12in vertical one with the new name 'Rivet Flare'. It returned to operations with the 7405th Support Squadron where it stayed, among the last few C-97Gs, until withdrawn from Germany in late 1975. It went to MASDC and the Arizona desert in March 1976.

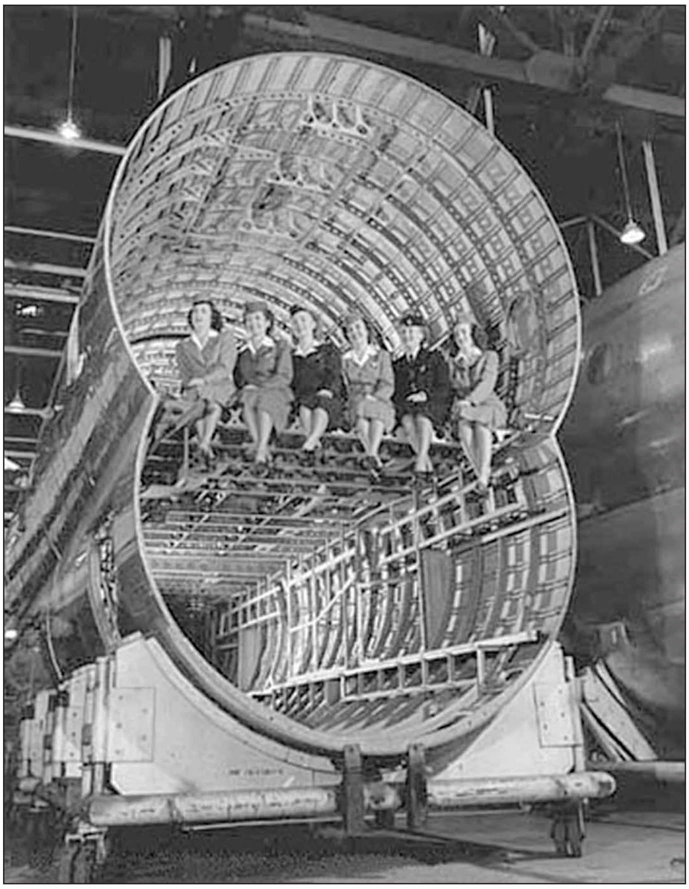
C-97G (52–2687) was first deployed to Europe temporarily in October 1961. It was a combined photographic and ELINT aircraft first known as 'Flint Stone'. With camera and ELINT equipment hidden from sight, it was possible to sometimes continue the fiction of being a 'courier and USAFE transport aircraft' by carrying small amounts of freight. Mainly engaged on Corridor flights, it also flew some peripheral missions. Returned to the squadron following depot maintenance in 1964, the aircraft briefly operated from Dakar to fly missions over the Belgian Congo in support of US interests in the civil war there.[23]

Table 1: C-97s operated by the 7405th Support Squadron[27]

Tail Number	Known Code Names	Main Role	Notes
49-2592	PIE FACE	PHOTINT	1953–62 converted to C-97A
52-2678	RIVET TUB	Support/Trainer	1968–69 dual navigator position
52-2724	SIDE KICK RIVET GIANT	PHOTINT PHOTINT	1961–62 then to PACAF. Returned to 7405th 1969–75
52-2639*	LITTLE GUY RIVET GUMBO	SIGINT SIGINT	1963–69 transferred to Israel 1970
52-2686*	SMALL FRY RIVET FLOWER	SIGINT SIGINT	1964–69 returned to US
52-2687	FLINT STONE RIVET STEM	PHOT/SIGINT PHOTINT	1961–69 as joint PHOTINT/SIGINT 1969–75 as PHOTINT aircraft
52-2688	EAGER BEAVER RIVET BOX	PHOTINT PHOTINT	1963–69 de-modified in 1970 sent to AMARC
53-0106	WINE SAP RIVET STOCK	PPMS/ELINT ELINT	1965–75 PPMS mission. 1967–68 deployed to Philippines
53-0306	RIVET FLARE	PHOTINT	1969–75

* Exclusively used on non-Corridor missions

Another period of depot maintenance in 1969, saw the removal of the ELINT positions and new camera equipment was installed comprising a KA-81A with a 48in lens, KA-82 with a 12in lens and an RS-10 infra-red scanner after which it was renamed ‘Rivet Stem’. Staff Sergeant Bob Bregent has described how, ‘On C-97 22687 the ‘Big Item’ was in the lower front compartment – I never saw it ever – just the operators had access. The same for the ELINT compartment that required a key code to enter, so only the ‘Crows’ could enter it’. During that final incarnation, it was equipped with an APS-64 search radar and an AN/APN-102 Doppler radar to ensure very accurate navigation. It was the last C-97G to leave Wiesbaden departing on 18 December 1975.[24]



A manufacturer’s publicity image shows a C-97 in cross section during its construction. It gives a good indication of the space available below the cargo deck where the ELINT positions and camera equipment was placed on some 7405th aircraft. (Boeing)

The squadron used C-97 52–2678 as a ‘front-end crew trainer’. Using the designation of ‘Rivet Tub’, it retained a dual navigator position as used in the main mission aircraft.[25] Delivered in 1967, but without other special mission equipment, it was also cargo capable. This enabled it to fulfil the dual function of training new navigators and transporting equipment and materials. Its APS-64 radome was only a dummy one, the aircraft fitted with HF and VHF radio communications. As retired Staff Sergeant Bob Bregent explained:

> We brought the aircraft over from Wiesbaden and it was opened up for the public to look inside during the July 1968 Berlin Tempelhof Central Airport Open Day. It was even once used to transport a Water Buffalo from the Frankfurt Zoo and for long afterwards we still knew exactly which plane it had been carried on!

It only remained with the 7405th until July 1969 after which it was returned to the US. A single standard KC-97F (51–0246) was briefly used for support work and crew training between 1963 and 1964.[26]

The available descriptions of C-97 sensor fits are a little limited. MSgt Craig Wilson joined the 322nd TAW at Rhein-Main in October 1973 mainly to work in support of the 7th Special Operations Squadrons MC-130Es infra-red sensor. From July 1975, he worked on similar sensors on the newly arrived 7405th C-130s. He explained his brief introduction to the C-97s camera fit at the time he was introduced to the Corridor programme:

> The C-97s had two systems that were referred to as Item 1 and Item 2. These electro-optical sensors were film-based airborne camera systems. Item 2 was a panoramic camera that used a rotating prism to scan 90 degrees. Hidden in the floor under the C-97s flight deck it looked directly under the aircraft, the scan could capture a continuous map of the aircraft track, 45 degrees on each side of the centre. Item 1 was a very large focal length camera (60 inches then, as I recall) also hidden under the cargo compartment floor. On the day we were there, one of the ‘B’ maintainers was working on Item 1 so we had a peek at the cramped section. Not enough room to stand, they had to work on their hands and knees. It was cradle mounted so it could swing from side to side of the aircraft. It looked out through special optically clear clandestine windows that could be hidden very quickly in an emergency.

C-130 AIRBORNE COMMUNICATION RECONNAISSANCE PROGRAMME (ACRP)

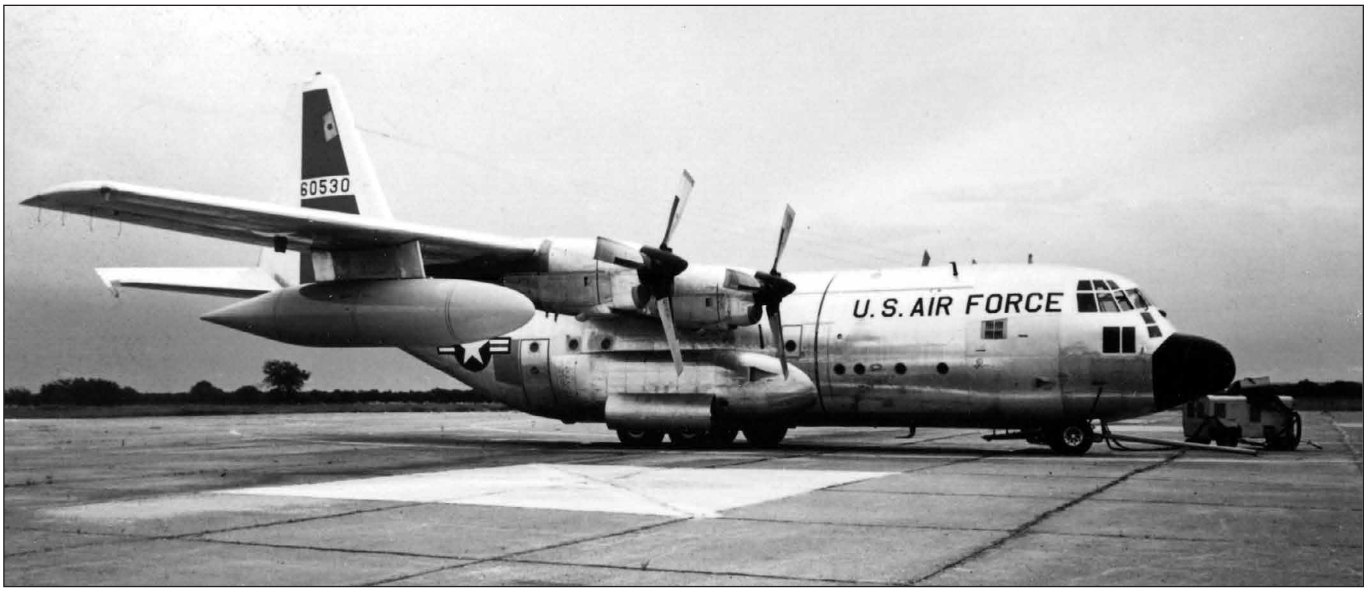
'Big Safari' converted 10 new C-130As direct from the Lockheed production line to become C-130A-IIs and codenamed them 'Sun Valley I'. The first aircraft for the 7406th Support Squadron arrived at Rhein-Main in late May 1958. These C-130s replaced earlier RB-50 aircraft, taking over a peripheral mission requirement to collect communications intelligence.

The 7406th SS provided the five man flight crew and aircraft with 10 specialist operators and two maintenance technicians supplied by Detachment 1 of the USAFSS's 6911th RSM.[28] Navigational accuracy was vital to these C-130s, so they were fitted with the 'APN-99'– an early Doppler system. The C-130s traditional underwing fuel tanks were discreetly replaced with similarly shaped, but slightly larger, fibreglass replica 'tanks' that contained sensor antennae. The main cargo deck was fitted with 10 intercept positions along the aircraft's right-hand side. Its VHF and UHF receivers detected and recorded voice communications with HF receivers used to track Soviet air defence morse transmissions. The rear of the aircraft contained an electronics maintenance station. Crew comfort was considerably better than on standard C-130s with four airline-type seats, a galley and toilet to the rear of the aircraft.

Missions were flown at around 24,000ft and could last 12 to14 hours. They normally covered familiar patrol routes. These included a Northern route, flying northeast to Kiel Bay to enter the Baltic, then over Bornholm to orbit areas off Swedish Gotland. A central route over West Germany went from Rhein-Main East to the Bohemian Forest and where, after orbiting for eight hours, they returned to base. The aircraft carried German, Polish and Russian linguists and also listened to the Soviet air defence network tracking aircraft flying down the Corridors. The Southern route covered the Adriatic. Leaving Rhein-Main it would head south across Austria down to Venice, then southeast to orbit over the Adriatic opposite Yugoslavia. Sometimes crews night stopped at Aviano or NAS Capodichino before returning to Rhein-Main. Flights further afield often required routine detachments to Turkey and Greece.[29]

Tragedy struck on 2 September 1958 when 'Sun Valley I' C-130A-II, 56-0528, was lost over the USSR and her six flight crew and 11 USAFSS operators perished. Two pairs of Soviet fighters were scrambled and intercepted the C-130, shooting it down. It crashed just over 34 miles northwest of Yerevan, well inside Soviet Armenia.

Out of the 10 ACRPs, at any time, one would be in Texas for major rework, with another on phased maintenance at Rhein-Main. The remainder were tasked to fly approximately 18 Baltic Sea missions, 30 in the east Mediterranean, eight in the Adriatic, four in the Aegean and six more over the Western and central Mediterranean area per month. Individual flights could achieve considerable coverage. For example: 'an orbit over the Aegean between Thessaloniki and Alexandroupolis allowed the ACRP aircraft to listen into the South Western Military District of the Soviet Union, also to keep a watch on Bulgaria and Romania'.[30] Their role was taken on by RC-135s in 1974 and the 7406th was inactivated.



'Sun Valley II' 7406th SS C-130B-IIs were employed on peripheral communications intercept missions against the USSR and Warsaw Pact countries from 1958. Note the discreetly enlarged wing tanks that housed antennae for the COMINT equipment. (USAF 21st AF)

Flying the C-97s into Berlin

In August 1971, then Second Lieutenant Tom Weinzierl, arrived at Wiesbaden directly from pilot training for his first operational assignment. He explained:

> Shortly before I left for Germany, I received a letter from another Lieutenant already stationed at Wiesbaden who told me we fly cargo to Berlin. I didn't know at the time, but of course, that was just cover … The squadron had only recently decided it would accept new pilots on the unit. Before that time, they had mainly used experienced aircrew, many with tours in Vietnam flying C-130s and C-7 Caribous … [the CO and Squadron Operations Officer explained] that 'we haul cargo if there is any, but what we do is photograph and pick up electronic reconnaissance as we fly down the Corridors'. I was just a young Second Lieutenant, so for me, it was just sort of 'OK, let's go' and we got on with it. I started flying with an initial interim security clearance while we awaited the full one. They did that thoroughly too. Later on, when

> I returned home, some people told me that the Air Force had been around to ask them questions about me.

Tom explained that the C-97 was a very stable airplane with pretty basic instruments, the airframe was very reliable but its biggest problem was the engines. Its four Pratt and Whitney R-4360 Wasp Major engines had 28 cylinders and produced 3500HP but were subject to quite frequent problems and failures. He went to say:

A staged shot of a USAF KC-97 flight deck shows just how spacious it was compared to many other aircraft types. Corridor C-97s had two navigator positions. (USAF)

> On my very first mission as the pilot in command, we were on a training flight for our EWOs over West Germany. We heard a 'whump' and the flight engineer had to shut the engine down. Differently from standard C-97s, the number three R-4360 on our aircraft had an alternator instead of a generator to provide the AC electrical power required for the special equipment we carried. As a result, we had to abort the mission, but the C-97 flew almost as well on three engines as it did on four and remained very stable.
>
> The C-97s cockpit provided the pilots and navigators with a very good field of view. Sat behind the two pilots were the two navigators used on Corridor flights. As pilots, we were not told the reasons why we went for particular targets. We were not even told what the targets were, though some were obvious. We didn't need to know anymore; we were there to fly the plane that was all. The radar navigator's equipment gave him a 360-degree view around the aircraft and he was our main source of information as we progressed along the Corridor, keeping us the required distance from the Corridor edge and one mile from the boundary of the BCZ when we were over the City. We had other systems like the VOR beacons but we relied pretty much on the radar navigator. He positioned us to get our targets to the side of us in the right position. The C-97 had a very good compass, a large display that had two-degree increments, so you really could read it to one degree. That was very handy for flying precise ground controlled approaches in the frequently poor German weather.

The second navigator, soon after take-off, mounted a viewfinder on pads to the left and right side of the pilot and co-pilot. These looked out from the side windows and enabled the navigator to help guide the pilot onto the target by suggesting slight course changes or lowering the wing to make sure they captured the target in the viewfinder. He also operated the button that activated the camera.

We tried to fly as high as we could within the 10,000ft Corridor ceiling whenever we could, as that automatically gave us a better view. But most of the time we had to fly much lower to suit the weather conditions and keep below the clouds. We did not open the camera doors if we were below 3,000ft above ground. Pilots carried a strip map on their lap that reflected our progress down individual Corridors, rather than a normal full set of Air Force flight maps. As we progressed along, we were only allowed to make a maximum of 15-degree course changes at a time. But no rule said we could not do a 15-degree turn, roll out and then do another one. Within the Control Zone, it was a maximum 180-degree turn, but again we could do the same thing, roll out and then do another turn if we needed to. We just didn't want to look too obvious and to be seen circling over a single point or target. Our rules said that inside the BCZ we were allowed to fly for up to 30 minutes for 'pilot orientation' and we pretty much did that at every opportunity we could. If the weather was OK and with a 40-mile diameter circle flying at 190kts, we could fly within a mile of the edge make reasonably tight turns and get a good view of the whole zone below us.

With around a maximum of seven crews on the squadron, as individuals, we would fly on average once or twice a week. During my first year or so, that included the weekends, but that was ended for some reason. A normal flying day for us started at 0800hrs with a briefing. Our part was pretty short, covering which Corridors we were using on the way in and out, local weather, reminders of how close we could go to their edge and BCZ. That would be about it and in half an hour or so we were finished. We would then go over to Base Ops to fill out the flight plan with BASC, while the navigators continued with all their detailed map stuff. We got some breakfast, picked up our flight bags and went to the aircraft. The flight engineer and Scanner would be there pre-flighting the aircraft. We were ready to start-up and take off at 1000hrs.

Departure times could be staggered to allow for weather, Soviet air and ground activity or to optimise light angles and seasonal conditions. The aircraft, at that time, used their tail numbers as call signs so the Soviets were always aware of which C-97 was approaching and passing down the Corridor. Depending on

> which Corridor we used we would usually be in Berlin by 12.00 to 12.30hrs.

Tempelhof airport was in a built up area of the City and as Bob Bregent described 'The approach to Tempelhof's single runway was between parallel apartment buildings and over a cemetery. On hot days, we would take-off with people looking down at us from their balconies as we passed by!'

Tom Weinzierl continued:

> After lunch, we returned to Wiesbaden, mostly back by around 1630hrs unless we had stayed at Tempelhof longer for some reason. A camera that shot directly downwards from under the fuselage was sometimes fitted with infrared film. On those occasions, we would fly into Tempelhof later in the day and return home towards dusk. Along the South Corridor in particular there were a couple of airfields that we could directly overfly and take images of aircraft that were not there anymore but we could still 'see' because of the heat differential they had left.
>
> We had four operational aircraft during my time. One was just fitted with cameras (53-0306), aircraft 53-0106 was primarily ELINT with its electronics compartment in the lower forward part of the aircraft, rather than the aft. It had no large camera, just the 10in vertical tracker camera in the lower fuselage. Two more had a large camera forward and so their EWO compartment was to the aft (52-2687 and 52-2724). All these sensors were hidden from sight. You could walk on the C-97s main cargo deck and you wouldn't know anything was going on. There were just a few seats, perhaps up to eight, at the rear of the crew compartment. Sometimes we might have up to 15 people on the aircraft comprising: two pilots, two navigators, a flight mechanic, a loadmaster, a camera operator, a scanner, two US Army Aerial Observers and five to seven EWOs if they were training new operators.
>
> Our flights became pretty standard just with some variations. On occasions, the EWOs would say they had detected a fighter aircraft following us and soon we would see them – nearly always MiG-21s. During my initial check ride to become an aircraft commander, as we passed along the Corridor into the BCZ, BARTCC told us that they were dealing with a bomb threat to a Pan Am plane. So, we took our 30 minutes flying the Zone and departed straight out of the Centre Corridor back to West Germany. It was our 'escape route' if anything happened because it was the shortest. That was the only time I ever flew into Berlin and back without landing.
>
> We got used to flying these missions, but you always had to be careful and well aware of what you were doing, you couldn't relax. It was a great mission because we were, especially at that time, particularly supporting Air Force efforts in Vietnam. We kept intelligence updated on the Russian SAM types and it was the only place in the world I knew of where you could fly over a Russian SAM site and not get a missile up your rear.
>
> In case of an airborne emergency, we carried parachutes. They were kept on the airplane. I guess it would have looked strange for a transport crew to be walking to the airplane each time wearing chutes. We would adjust them to fit us and then hang them up in a row in the cabin. Aircraft commander first, co-pilot next, and so forth. We did not wear them in the cockpit. If there was an emergency bailout, the aircraft commander was the last out and was supposed to grab a flare from the cockpit wall, ignite the night end and throw it in the lower forward compartment. The camera operator was supposed to unreel the film and leave it on the floor, then pour hydraulic fluid over it. The flare was to ignite the pile. From there you would go to your chute, put it on and go to the aft escape hatch and jump. All the while, the airplane may or may not be in a stable enough situation to allow you to do all that. Great procedure in theory, but probably not in practice.

C-97 Loadmaster

In 1968 loadmaster Staff Sergeant Bob Bregent was briefly at Hahn AB, then equipped with F-4s, before being sent to Wiesbaden AB. He recalls:

> I knew nothing of our mission and arrived there late one night and went to the Mess Hall and sat down with a group of five guys. They asked what unit was I was going to be with serving with and when I told them the conversation just stopped dead. The next day I went to the squadron and was briefed by Chief Master Sergeant Red Bouldin and began six weeks on the job training. I

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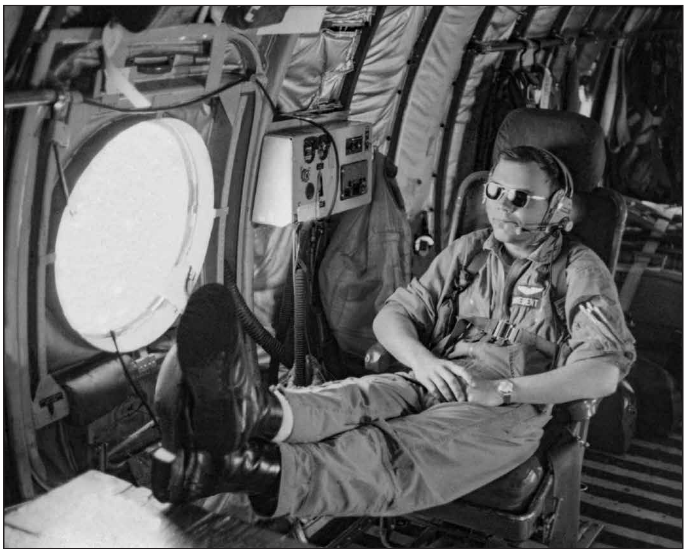
Is it a 'camera ship' or a 'photo ship?' 'Rivet Flare' C-97G sits on the flight line at Wiesbaden AB, all sensors carefully hidden, only to be revealed after climbing above 3,000ft and in the Corridors. (USAF)



C-97G Load Masters doubled as 'Scanners'. The control panel next to the plexiglass observation bubble contained a button to immediately close all the external covers that hid the sensors if a Soviet interceptor approached. 'It was also used to hook up our oxygen masks, with a dial to monitor the air flow'. Out of the Corridor, Staff Sergeant Bob Bregent takes the opportunity to relax in his seat. (Staff Sergeant Bob Bregent)

> soon learned that not only was I going to be a loadmaster but lots of other things too. 22687 and 22688 were our primary aircraft at the time and we usually concentrated on flying the Southern Corridor and some peripheral missions.

A key part of the Loadmasters job was his responsibility for the cargo loading however large or small it was.

> We used a slide rule to calculate position the centre of balance for the load we carried. It had to be between 18.25 to 30.5 of Mean Aerodynamic Chord. Outside of those limits the aircraft could fly nose low or tail heavy. The loadmaster had to sign off on a 'Form F' to certify that the aircraft was 'in-balance' before the pilot could take off.
>
> The Pratt & Whitney R-4360 Wasp Major engines were a reliable engine but maintenance intensive. On my very first flight, after I got through my on the job training, everything was set correctly and we accelerated down the runway. As we approached V1 speed at which take-off could not be aborted, the number three engine I was watching began to blow heavy white smoke. I instantly reported it to the flight engineer, Chief Master Sergeant Red Bouldin, just as we had been trained to do. We were already halfway down the runway, but he instantly put the engines went into reverse and we slowed and pulled off the runway. The AO on the other side of the aircraft had flown on C-97s for a long time. He was very experienced and told me 'Bregent you're going to the brig' because I had 'killed' a priority 'A' mission. I shook like a leaf but Chief Master Sergeant Bouldin, came down to take a look and after I explained what had happened he told me I had done completely the right thing. A half inch oil line had fractured and was spraying oil onto the engine causing the smoke.
>
> Doubling as Aerial Observers down the back of the aircraft, our plexiglass observation bubbles gave us a great view, forward, aft, up and down. The AOs had a panel next to us that sported a red button which we would hit should any aircraft approach us and it would close all the camera doors and ELINT antennae instantly. On one occasion we were flying down to Greece over the Adriatic, 12 miles or so off the coast. Opposite Yugoslavia I spotted two small black dots at our six o'clock low, reported them to the aircraft commander who requested a running account of the event. Identified as two fighters they buzzed us right and left, wing tip to wing tip. The aircraft commander asked me what kind of fighters were they? 'Sir, they looked like straight winged F-84s!' Early American built aircraft from the 1950s! That's exactly what they were, having been supplied to Yugoslavia by the US many years before and which remained in service until 1974. After that we carried hand-held cameras in case it happened again so we could take photographs.

New for Old

Before arriving in Germany in 1973, Captain Sam Baker had spent two years as a navigator flying the same 'E' model of C-130s on tactical airlift missions stateside as he would ultimately do with the 7405th. That was followed by a year flying electronic warfare missions in SE Asia. As he explained:

> Anticipating my next assignment following Vietnam, I requested a move to Europe and my orders sent me to join the 7406th OS at Rhein-Main AB. I knew nothing about their role and there was only a brief sentence in the base's orientation literature about the unit. However, I did have an inkling of what their role might be from members of their sister squadron out in the Far East who I had met in SE Asia.
>
> I had been flying C-130s with the 7406th for about a year, mainly from Athens, when word reached us that the unit was going to close down. When the squadron closed in 1974, nearly all the flight deck crew members returned stateside except for three of us recently arrived navigators. We'd all previously indicated a willingness to remain in Europe and a need existed for navigators at the 7405th in Wiesbaden. Unlike pilots, our navigator training enabled us to easily transition between the 7406th's C-130Bs and the 7405th's C-97Gs. Whilst we knew of the 7405th we had no real knowledge of what they did or had any interaction with them before our reassignment. However, it was not difficult to fill in the blanks and make a reasonable guess. When I got to Wiesbaden, I met with the 7405th squadron commander, 'What do you think we do?' so I told him and I think he was a little bit crestfallen, that I had been able to work out pretty well the squadron's role.
>
> The 7405th C-97s carried two navigators who had to work closely together. 'The Forward Nav' was responsible for visually positioning the aircraft at all times and making any necessary in-flight weather decisions affecting targeting. He would revise speed, altitude and heading requirements accordingly; actuated some of the aircraft's systems and repositioned the aircraft as necessary while the equipment operators readied the systems for operation. The Radar Nav' was responsible for electronically tracking the aircraft's position at all times; responding to weather-induced changes in-flight and re-prioritising the targets accordingly. His position calls typically took priority over those of the 'Forward Nav' especially when we were operating near our one nautical-mile 'red line' close to the edge of the Corridors and BCZ. The two navigators constantly coordinated throughout the mission. A continuous dialogue had to be maintained between them to maximise target identification and imagery collection and ensure mission safety. The pilot in command always maintained control of the aircraft, but the navs' determined how and where the mission would be accomplished.
>
> Our C-97Gs had been retrofitted with an APS-64 search radar, once used as part of the B-47s bombing-navigation system,

> housed in a dome under the fuselage. This was an extremely accurate system and much appreciated by the Radar Navs using it. When the C-97s were retired nobody was happy about going back to using the standard C-130 radar as it was less suited to our specific mission purpose. Both aircraft types had two navigators' positions, seated side by side and for us, the most significant difference from standard aircraft. The C-97 was spacious living. As you stepped from the rear compartment into the flight deck there were two navigators' positions on the left, to the right a toilet. Past that was the flight engineer, almost in the middle facing the right side of the aircraft. You could go either to the right or left of him to come up to the pilot's seats. There was a lot of empty space on the left-hand side, so it was a spacious flight deck.

Sam Baker explained in more detail:

> Stepping onto the flight deck, the nav's seating was on the left … the toilet on the right.[31] Directly beneath the aisle was a full-sized door in the deck floor that hinged on the right. When opened it was secured with an elastic cord onto the toilet wall. This afforded access to a fairly deep (around 5ft) and long avionics bay. Also, there was a small round window at the front of the bay which gave a view into the nose gear compartment. In the before landing checklist, the two navigators sat next to this door in the deck and ensured it was open and secured. During the landing approach, as the landing gear was lowered, the nav would look down there at the round window. If he saw daylight, it provided visual confirmation that the nose gear was extended. While a verbal confirmation was required by the checklist, the nav would typically just trip the elastic cord allowing the door to loudly slam down and shut. This gave the pilots an audible (albeit not verbal) confirmation that the nose gear was extended.
>
> During one final approach to Wiesbaden, one of the two copilots sat in the rear of the aircraft decided to observe the landing from the cockpit (we often carried two copilots so each could fly a leg of the round trip). He opened the crew compartment door and blithely stepped through it without looking … and swiftly disappeared down into the open avionics bay. The shock of his falling into the bay jarred the elastic cord free and the bay door loudly slammed down on top of him. Both navigators were still facing away from the aisle and didn't see him disappear through the floor. Both had heard the door slam and knew it signified that the nose gear was extended as per the checklist, but each assumed the other nav had done it. They rotated their seats to face forward for the landing and effectively blocked the door shut. Below, having recovered his wits, the stunned co-pilot in the avionics bay began banging on the door. However, the C-97 was a loud and vibrating machine so his thumping on the door was not heard by the crew. It was only after landing, as the aircraft was taxying, that his cries were finally heard. So it was that the hapless (and fortunately uninjured) co-pilot had the dubious distinction of logging the landing, not from the right seat, but down in the equipment bay!

Needless to say, the episode became part of 7405th folklore.

> The C-97s, themselves derived from the World War II B-29 Superfortress, were a technological throwback to a disappearing piston-engine era. But they carried with them a certain nostalgic appeal, not to mention idiosyncratic behaviours giving them a 'persona' of their own. I look back on my time in C-97s with a special fondness not shared with C-130s which although a fine aircraft in its own right, I feel did not have the same 'panache' of the C-97s.

Passing the Baton

By the mid-1970s, few KC-97L tankers and even fewer C-97 cargo aircraft, were still flying. The remaining US Air National Guard KC-97L tanker units maintained a small rotating presence in Europe and as mentioned earlier, the USAF C-97s Stratofreighter's transport role had long been assumed by Lockheed's much more versatile C-130 Hercules.

C-130 airframes were freed up by the end of US involvement in SE Asia and this conveniently came along as the Wiesbaden C-97s rapidly approached the end of their operational life. It meant that several C-130Es with their more modern avionics and a far more flexible cargo deck were available to replace them on Corridor operations.

As well as acquiring a new aircraft type, the decision was made to switch flight operations from Wiesbaden AB and transfer them to the very busy Rhein-Main AB, just over nine miles away, on the southern side of Frankfurt's busy civilian airport. There the new aircraft were easily hidden among the already resident C-130 transport squadron. As the phase-out of the C-97s at Wiesbaden began, scheduled for completion by late 1975, arrangements for the arrival of the 'new' C-130Es at Rhein-Main accelerated.

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C-130, SUPER SENSOR PLATFORM, 1974–90

The transition to the C-130E was a smooth one which took place over nearly a year. The unit administrative functions were established at Rhein-Main with Lieutenant Colonel Alfred Davidson as the new squadron commander and navigator Lieutenant Colonel Jessie Blankenship as the Executive Officer. Both had prior C-130 intelligence experience with the 7406th SS. Meanwhile flight operations continued from Wiesbaden. As the new C-130Es began to arrive one at a time and their crews became mission qualified, the C-97's flight schedule was gradually scaled back. Eventually, each of the C-97s was ferried back to the US for disposition, with the final shut down of the squadron at Wiesbaden accomplished by January 1976.

Witch Doctoring

Among the second major batch of standard C-130Es ordered for the US Air Force, several were diverted for conversion by 'Big Safari' to a small number of special projects. Among them were three aircraft that would eventually become the mainstay of Corridor operations up to the end of the Cold War. C-130Es 62-1819, 1822 and 1828 were part of a five aircraft batch converted for the 'Witch Doctor'

Transition to the C-130E saw the 7405th move from Wiesbaden to the much larger airfield at Frankfurt. Photographed in 1988, the northern side was a busy civil airport and the southern side the USAF's Rhein-Main AB. (USAF/MSgt Patrick Nugent)

programme in 1966. The work was completed at Lockheed Aircraft Services, Ontario California where they became covert photographic platforms with the installation of an underfloor KA-82 panoramic camera. The programme was known within Tactical Air Command as 'Coronet Doctor'. The completed aircraft was assigned to the 36th TAS at Langley AFB, VA, soon controlled by the 62nd MAW at McChord AFB, WA.

Externally 'vanilla looking' standard C-130Es, they flew to destinations across the world almost unnoticed. The camera and associated equipment were installed under the floor behind the nosewheel and 'bulkhead 245'. Externally it was covered by two retracting doors. When opened, they exposed a photo grade window that allowed the aircraft to remain pressurised whilst taking images. The controls for the camera were fitted to the navigator's interphone panel. Access to the camera was via panels on the cargo hold floor.

The special equipment compartment could not be accessed via the floor panels using standard tools, instead, special tools were required, only given to cleared crews to prevent unauthorised maintainers from opening when it was flying normal cargo missions. The compartment contained a KA-82 camera body and lens, film cassettes and a refrigerated store for exposed and unexposed film. A standby arrangement allowed the KA-82 to be moved to one side of the compartment and a Hasselblad camera with a long lens and remote shutter release to be put in its place if the primary camera failed. These five aircraft were not permitted to operate from unpaved fields during their normal transport operations.[1]

Captain Sam Baker flew as a regular navigator with the 36th TAS from 1970 to 1972. As he described:

> There was nothing especially notable about the aircraft to the crews as we all flew them. There was a special flight within the 36th that flew 'missions'. At such times, the aircraft was fitted with a roll-on/roll-off 'comfort pallet'. Ostensibly there to offer a few more creature comforts to its occupants on long trips … typically to Iran in those days. Little was said about the missions, and even less was asked.
>
> We rotated to Europe annually and flew out of RAF Mildenhall for three months. In that time, we flew anywhere and everywhere and that would've included the specially equipped planes. Even if we only had three of the five so modified, those three would've comprised nearly half of the seven planes typically in the squadron. They certainly would not have been left stateside during our rotation. As the situation warranted, we'd fly embassy support missions into Bucharest, Warsaw and Moscow. I flew into Warsaw and we didn't carry a Polish escort for the trip and I doubt Bucharest did either. Moscow did, however. Were the modified aircraft on these flights used to collect information on the sly? I've no idea.

The programme was terminated in 1973 and the aircraft largely de-modified, but it was not long before they would be called upon to perform a much more sophisticated mission.

Three former 'Witch Doctor' airframes were selected for a new project to replace the remaining C-97Gs at Wiesbaden rapidly approaching their planned withdrawal date. During the latter half of 1975, the 7405th took delivery of its first newly modified C-130E (codenamed 'Rivet Duke'), to be used under the codename 'Creek Flush' (later 'Creek Misty') operations order for Corridor, BCZ and

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C-130E 62-1822 photographed at Prestwick in Scotland during 1964. It was converted to 'Witch Doctor' configuration in 1966 and in 1975 modified for Corridor missions. (Dave Welch collection)

some peripheral missions. They greatly improved reliability over the C-97s and were far more versatile than their predecessors, effectively combining optical and SIGINT collection roles.

MSgt Craig Wilson had arrived at Rhein-Main in October 1973, initially assigned to the resident 322nd TAW as a specialist to work on the sensor equipment carried by the 7th Special Operations Squadron's MC-130Es. In 1975, Rhein-Main's cargo mission was transferred from USAFE to Military Airlift Command and at the same time, the 7th SOS's special systems support transferred to a newly created USAFE Detachment. He explained:

> When the 7405th transitioned to the 'Rivet Duke' C-130Es, they brought along two systems that were the mainstays of the Corridor mission carried by the C-97Gs. [The first was the KA-82 panoramic camera, known as Item 2.] It was hidden under the C-130s cargo deck and looked directly under the aircraft. The scan could capture a continuous map of the aircraft track, 45 degrees on each side of centre.

This was the same camera carried during their Witch Doctor days. Fitted with a 12in lens, it used a 2,000ft canister of 5in-wide film producing 24in-long negatives. When the nosewheel was down, its door covered the KA-82 hatch.

The main camera was a KA-81 with a 48in focal length lens.[2]

> It had a very large focal length that was far too big to place under the cargo hold floor. Early on it was generally referred to by the crews as 'Item 1' and later on as 'The Big Item' It was cleverly hidden in the cargo bay as a large box on a standard 463 Master Pallet, 108in long by 88in wide (276 x 224cm). The box was constructed from lightweight honeycombed metal sheet, painted dark green and covered with a standard cargo net complete with cargo strapping. A casual observer peeking into the loading ramp would see a normal looking, albeit very large, cargo package.

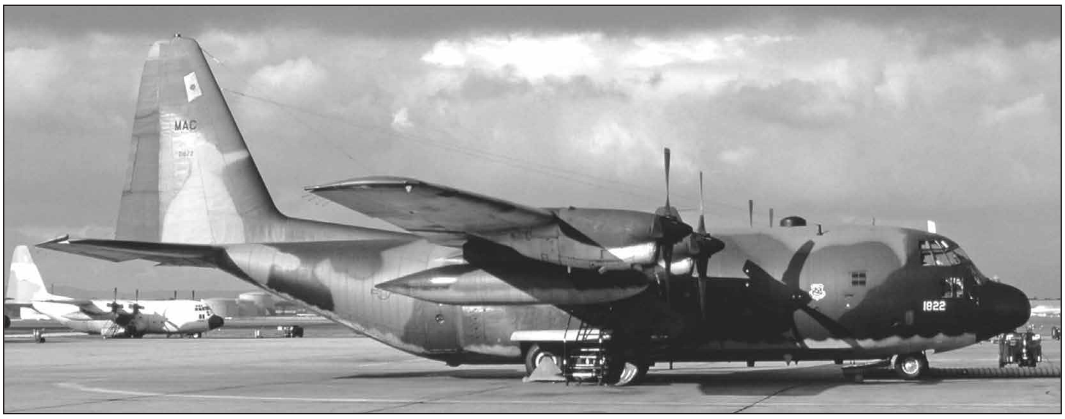
This box also included the operator controls for all sensors and the environmental control unit. The camera was mounted in a rigid A-frame cradle that allowed the camera to be electrically repositioned to face either the left or right side of the aircraft as required. On each side, the lower part of the box's sides could be swung up to allow the camera to swing out to the window on either side of the aircraft. When not in use, the interior of the windows were covered with painted plywood covers to look like typical fuselage interior.

> The tolerances were very tight to the inside of the aircraft. The camera was mounted on a granite base to give it good stability but made it very heavy, weighing about one-and-a-half tons. It used a 2,000ft film canister of 5in-wide film. Operated in the oblique mode, it was often referred to as the 'H-Pan' as the optical path could be controlled at a stationary angle or swept from about 30 degrees up to the horizon. The exposure rate could be set by the operator to produce either a 12 percent or 56 percent overlap to provide stereoscopic pictures. The frames produced could be up to 48in long but the camera could be set to produce smaller frames if required.
>
> To keep the camera system and its granite base at a specific stable temperature, a dedicated environmental unit provided heating or cooling. This eliminated distortion in the optics and allowed the film to run perfectly flat as it travelled across the camera platten, providing the highest possible resolution. The environmental unit was run on the ground from a Ground Power Unit for three or four hours before departure to stabilise the temperature of the equipment.

The air conditioning unit was mounted on top of the pallet, if it failed, Craig explained it was difficult to access to remove or work on, as it was close to the aircraft roof. He recalled an incident when he was working in his repair shop close to the flight line:

> There was an urgent pounding on the workshop door. It was a young crew chief who said the aircraft was on fire and what should he do? We had standing orders that if one of our aircraft caught fire, we were to just let it burn. We were not to call the base fire services because they were manned by German civilian firefighters who were not cleared on any of our special equipment. The crew chief had opened the front crew door to be faced with a cloud of what he thought was smoke, but it was the coolant from the camera's environmental unit, a hose had come loose and filled up the closed up aircraft with a heavy smoke looking mist.

C-130E 62-1828 on the flight line at Rhein-Main with the distant Frankfurt civil terminal visible on the opposite side of the airfield. (Manfred Faber)



C-130E 62-1822 at Rhein-Main. The most obvious difference with standard C-130Es was a third aerial that ran from the tail to the fuselage. (Manfred Faber)

Using the C-130 airframe allowed the programme to take advantage of readily available logistics at Rhein-Main for the other standard transport C-130s there. All the normal aircraft maintenance was done by the host wing. Only a few individuals in certain shops, who supported systems that directly connected to our special aircraft were read into our programme. For example, when the environmental units failed, I had to find the right individual in the host wing environmental shop to diagnose and repair it. Their bosses often tended to be a bit put out when I would not tell him why an airman would be missing his regular duties for a shift or two.

When our C-130s returned from missions, the flight crew would write up any equipment failures on either a non-classified or classified basis depending on what it was. Non-classified documentation went through the host wing maintenance channels while the classified sheets were kept by the special systems maintenance team. Programme security dictated that ‘need-to-know’ was tightly managed; most folks in the host wing knew only that the aircraft had some special mission, no clue as to what that mission might be. Many assumed that these C-130s were just another part of the 7th Special Operations Squadron mission, as they were parked at the far end of the ramp, alongside their MC-130s. Crew Chiefs were briefed to two levels on our mission. Some had a much more complete induction into the programme. Others were told simply that ‘there are systems onboard you don’t need to know about but do need to protect’.

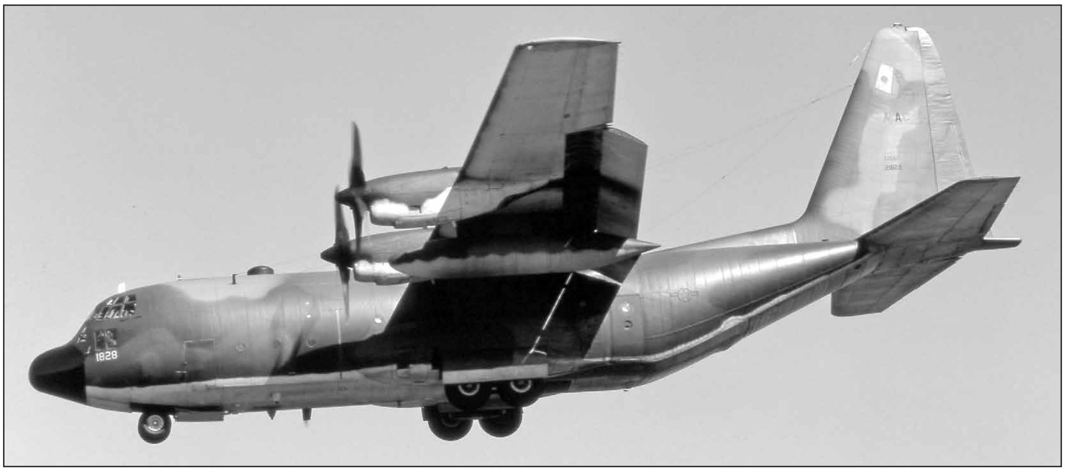
Robert Zoucha explained his experiences in the mid-1980s: ‘The main external distinguishing feature of the 7405th OS aircraft was a third HF wire antenna that ran from the tail to the fuselage, instead of the usual two on a standard C-130E’. In his time with the 7405th, the three externally similar 7405th OS aircraft shared a special section of the same flight line as the standard cargo C-130Es of the resident now (from 1975) 435th Tactical Airlift Wing. The 7405th aircraft were maintained by specially cleared personnel from the 435th Organisational Maintenance Squadron which allowed them to work on the special mission aircraft. Only those wearing special, discreetly marked flight line badges could access the three aircraft. Each airframe was kept locked and had a special alarm system installed that had to be deactivated before entry. Closely monitored by Rhein-Main’s Security Forces Squadron, if a crew member forgot to turn the alarm off, a lot of Security Police rapidly descended on the aircraft.

Rick Fuller flew standard C-130Es with the 37th Airlift Squadron at Rhein-Main, alongside the 7405th, in the early 1980s. As a testament as to how externally ‘ordinary’ the 7405th aircraft looked, compared to standard C-130s at Rhein-Main, he explained:

> On several occasions I had crew members from my Airlift Squadron get onto a 7405th aircraft, perhaps because they had misremembered the parking spot of our aircraft or thought there was a standard flight document they could borrow from another C-130. But they could not simply turnround and come off the aircraft once they realised their mistake. They would very quickly be arrested by the Security Police and laid down on the ground and taken to the base police station and thoroughly debriefed on what they had done, seen and touched on that airplane. Several times I got phone calls to go and retrieve these unfortunate individuals from the base police station.

The activities of the 7405th Operations Squadron continued to be very closely guarded at Rhein-Main. Robert Zoucha continued:

> The Base Commander knew the mission they undertook, as did the Chief of Maintenance. The carrying of passengers was prohibited and special permission had to be obtained for any non-crew personnel to fly on the aircraft. This even applied to the CINC USAFE, from 1984–87, four-star General Charles Donnelly, when he wanted to fly on a Corridor flight. [All the secrecy] seemed rather ironic because the Soviets knew exactly what we were doing. We were just keeping it secret from our people.



Another final approach into Tempelhof, the Aerial Observers door bubble replaced with a standard appearance panel. Main camera door closed (forward of the wing) and FLIR retracted into the aircraft. (Peter Seeman)

On the forward fuselage of cargo C-130Es, there were three small circular porthole windows, forward of the wings. In 'Rivet Duke' aircraft the middle window was false, part of a larger, hidden, 18×30in door that could retract into the aircraft, to expose a 2in-thick optical glass panel. Through that, the 'Big Item' took photographs without the need to depressurise the aircraft. Many former crew members have commented on how the panels that slid over the optical glass were so carefully made and fitted that even though they operated the aircraft, they still found them extremely difficult to externally identify on close inspection.

A third sensor, called Item 3, was the AN/AAD-5 infrared mapping device was included in the 'Rivet Duke' configuration when the C-130s came to Rhein-Main. Craig explained:

> It was taken directly from the RF-4C inventory. This system was mounted on the aircraft floor under the standard avionics racks just aft of the KA-82 installation. As you might imagine, hiding the windows for these items, as well as the window-less opening for AN/AAD-5 was quite an engineering challenge.

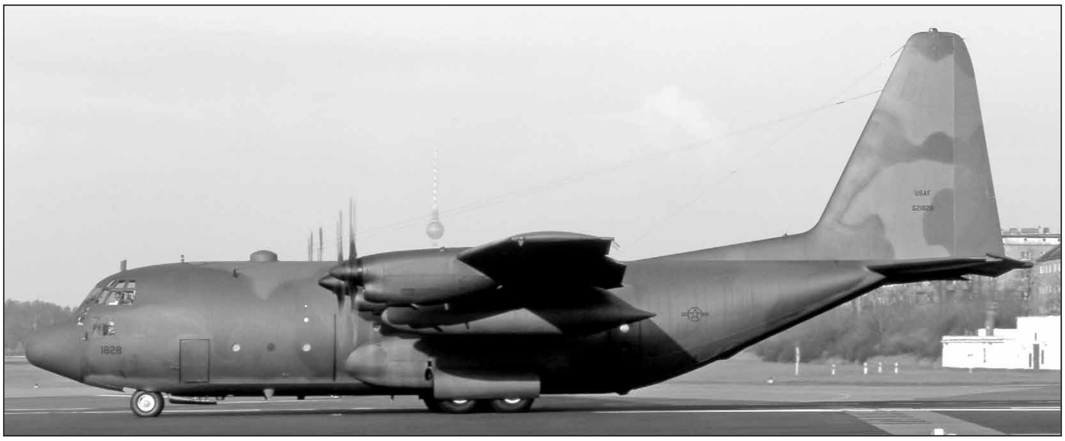
Helium cooled, it incorporated an infrared line-scan sensor and a four sided rotating mirror and looked from horizon to horizon, along the aircraft's flight path. At the usual Corridor flight altitudes, this created a map out to about 10kms. It detected reflected infrared energy through the optical device. This was aligned with the leading edge of the wing root and on the aircraft's underside and covered by a protective door when not in use.

Good quality observation windows were vital for the aircraft's two Aerial Observers (AOs). Unlike the C-97s, C-130s did not have observation blisters fitted as standard. Instead, the C-130Es rear troop doors contained a false panel that was removed when the aircraft was airborne but un-pressurised and replaced with observation blisters and a portable seat for the AO. This allowed them a much better view out of the aircraft.

There were times when there were just two aircraft available at Rhein-Main with the third in the USA for deep maintenance, updating, new equipment installation and repainting. Whilst the equipment fits were similar on each aircraft, they were not identical. As well as the standard engineering work, the C-130s required repainting every three years. Maintaining the paintwork in good condition was important to ensure the various covert sensor doors, hatches and aerials were properly concealed which could be revealed if the paintwork became more worn. The regular repaints also had to keep up with the frequent changes to paint schemes used on the regular 435th TAW's airlift C-130Es.

From early on, 62–1819 added a large cargo container (24ft long by 8ft wide and 8ft high) with positions for up to seven personnel.[3] One operator was responsible for the new Phase Stability Measurement System (PSMS) and PPMS equipment, made by ITT. There were two COMINT collection positions which listened in on VHF/UHF/HF voice frequencies, plus other equipment that collected Soviet/NVA electronic and data transmissions. Two Electronic Warfare Operator seats were intended to collect 'scientific and technical intelligence'. Operating equipment included using receivers from the Watkins-Johnson family of manual receivers like the WJ-8617B. Running the aft cabin was a 'Tactical Co-ordinator' or 'Collection Crew Leader'.

The large dimensions of the container used to accommodate these operators and their consoles, required a redesign of the FLIR installation. These modifications led to its re-designation as 'Rivet Kit' and gave 62–1819 a combined SIGINT and optical photographic capability. A further modification in 1980 (Creek Victor) was the installation of equipment that allowed the recording and measurement of Soviet SAM electronic emissions based within the range of the Corridors. This was used by the Warner Robins Air Logistics Centre to verify the capabilities of Radar Warning Receivers (RWR) equipment carried by many US and NATO combat aircraft against Soviet radars and ensure the radar and missile signal library was as complete as possible. One 1982 'Rivet Kit' mission targeted a Soviet SA-8 (Gecko) system in a total collection effort. The aircraft's ELINT operators



All but indistinguishable from a standard C-130E to the casual observer 62-1828 readies for take-off. The 7405th aircraft had to change paint schemes in line with other USAFE owned C-130s so that they did not stand out. (Peter Seeman) collected data on missile guidance systems and data for the RWR library. The FLIR operators imaged the launcher with its associated radar and the Airborne Observers watched it on the training ground below.[4]

On a typical grey Berlin winter day, 62-1819s 'European one' camouflage scheme was the final one used by 7405th aircraft prior to their deactivation. (Ralf Manteufel)

'Rivet Acorn'

In May/June 1985, 62–1822 returned from depot level modification and overhaul. Its old KA-81A camera was replaced with the new Fairchild Wesson KA-116 Surface Reach Imagery System (SRIS) fitted with a 72in lens. The camera was a significant advance over the KA-81A. It was mounted on a centreline gimbal instead of in the old style rigid frame arrangement. The KA-116 used three mirrors, weighed around 1,334lbs and used five-in square film. The camera produced results of extraordinary quality, regularly at the very high end of the National Image Interpretability Rating Scale (NIIRS), compared to the more usual mid-range scores of older cameras.

During that overhaul, additional modifications included a new container that carried the two FLIR positions and an upgraded COMINT collection known as '8660' and described as a 'major advance on the previous equipment'. The Texas Instruments SPF-1 FLIR was mounted in a ball in the rear of the left main undercarriage well. The associated control panel was situated on the cargo ramps of 62–1819 and 62–1822 and just aft of the 'Big Item' on 62–1828. If the aircraft was intercepted by fighters, the co-pilot activated a red toggle switch on the redundant JATO control panel, which retracted the FLIR ball and closed all the 'secret' doors in just eight seconds.

Three EWO positions were said to be dedicated to the collection of Radiation Intelligence (RADINT) – detecting the unintentional electrical radiation emitted by concentrations of cables, power grids and computers, although it is believed that this was not particularly successful. Other equipment installed during the refit included an AN/YUK-18 mission tape recorders, a Kearfott high accuracy SKN-2443 dual Inertial Navigation System (INS) and new communications equipment. The fitting of new wing boxes and Allison T56-A-15 engines used on the newer C-130Hs, replaced the earlier T56-A-7s of the C-130E models, in many ways made it a C-130H in all but name. 7405th OS personnel generally referred to them as 'C-130Es' and sometimes after the 1985 upgrade, as 'C-130 Super Es'. This new configuration led to a codename re-designation as 'Rivet Acorn'.

One unplanned effect was caused by the mandatory installation of in-flight voice recorders to the whole C-130 fleet. These recorders were normally required to be active at all times during a flight, which presented a particular problem for Berlin operations. When on Corridor missions, the systems circuit breakers were used to prevent the recorders from working. This was done to deny the Soviets any prima facie evidence of their clandestine activities if one of the aircraft crashed or force-landed in the GDR.

C-130 Pilot

Lieutenant Colonel Jon Martin arrived at Rhein-Main AB in October 1980. He joined the Air Force in 1972 after graduating from Embry-Riddle Aeronautical University. Before that, he had been an enlisted jet mechanic with the US Navy. He flew C-130Es and Hs out of Dyess AFB, Texas from 1973 until 1977 and then Boeing T-43As from Mather AFB, CA. As he explained:

> I had heard about the 7405th and was intrigued about the secrecy surrounding its mission. My wife was originally from Germany so that also made the assignment attractive for us. My main task as an aircraft commander whilst at the 7405th was to oversee and conduct the operation.

As part of their pre-flight briefings, squadron aircrew, in addition to their mission and flight safety elements, were also briefed on how to contact Military Liaison Mission teams in the field for assistance in case of a forced landing in hostile territory.

> The MLM were our safety net for escape and evasion. The centre Corridor was the quickest and shortest route between Frankfurt and Berlin and it was normally the route of choice in an unusual situation where we wanted to minimise our exposure over GDR airspace. A problem with the plane, or a communication issue,

The Soviet-occupied Neuruppin AB was close to the edge of the Northern Air Corridor and BCZ. It was home to the 730 APIB with their SU-17-M4s including 'Red 25' on final approach to the airfield in September 1990. (Rob Schleiffert)

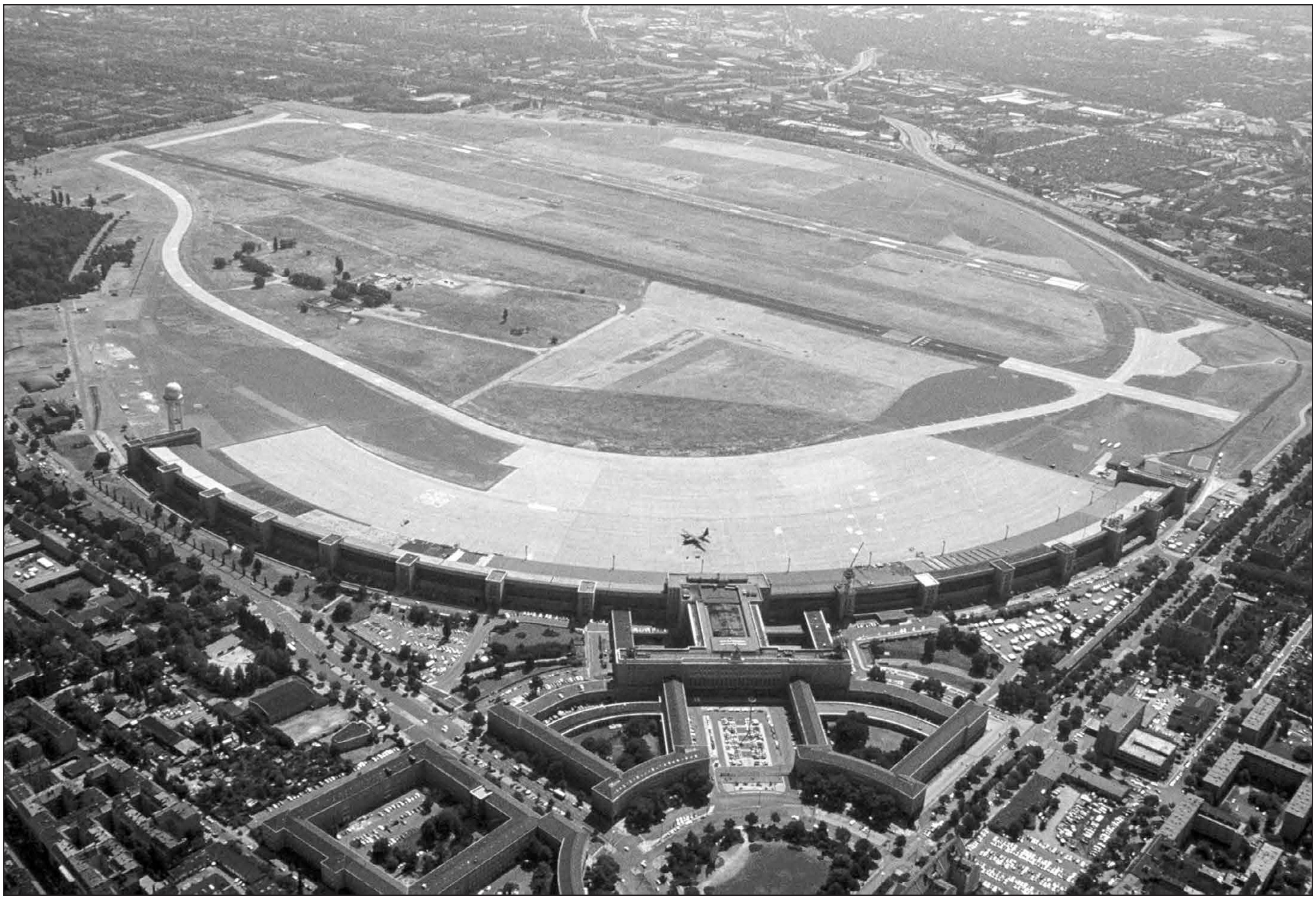
> would typically call for an exit along the Central Corridor, even if a different one had been planned.

Pilots and navigators became very familiar with the targets and areas of interest along the three Corridors but especially those on the centre and southern routes.

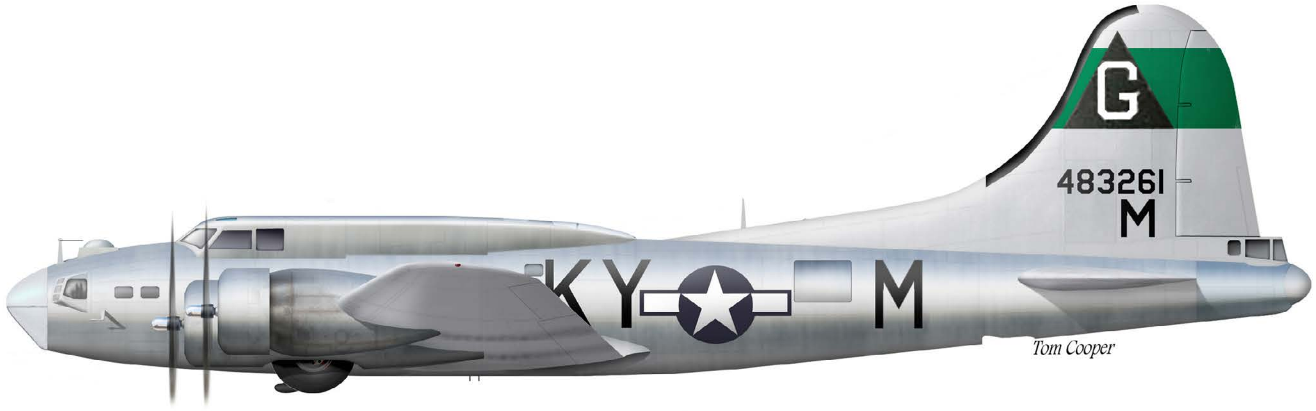
> Knowing our exact position, relative to the Corridor and Control Zone boundaries and how close we were to them was extremely important. Every pilot and navigator individually constructed visual maps of the routes they would use for reference on each mission and we constantly checked each other to confirm our position. An error there could have resulted in being shot down and/or the firing of some senior personnel at Rhein-Main.
>
> We gave our special names for landmarks and features along our routes and in the Control Zone. If you were an old hand and were well-liked, you might get one named for you such as 'Howel's Snout' or the 'Davis Drieeich'. The first was a protrusion of land near the Centre Corridor entrance, the latter the construction area of a new roadway on the north side of the BCZ. We also had Shmu Lake and many others.

As well as the serious business of collecting intelligence, there were sometimes more relaxed flights too. Jon explained that on one occasion:

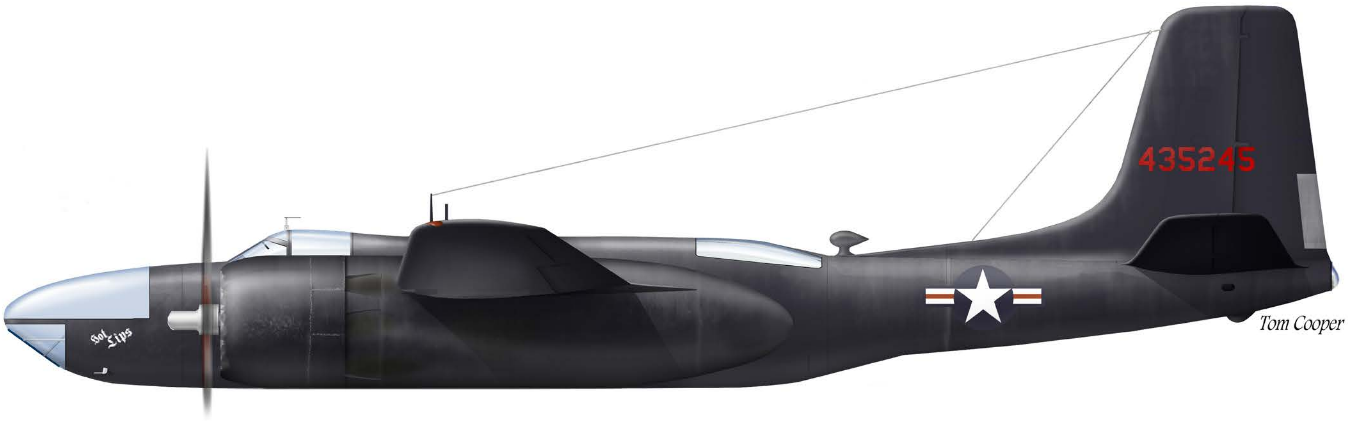
> The squadron was asked to provide airborne pictures of our C-130s for use in briefings to senior officers at the Pentagon who needed to be read into our programme. I got the job of planning the mission. We needed two aircraft in close formation, so the professional cameraman assigned to us for this mission could get the pictures he needed. We flew a trail departure from Rhein-Main and then a close formation after getting over the English Channel. The other aircraft commander was Bruce Berner, the Wing Stan/Eval Chief. It was fun flying formation again and we managed to get the pictures needed without incident or running into each other.
>
> Another special was a flyover of the Berlin airlift memorial during a VIP ceremony. The timing was critical. We flew into Berlin and went into a holding pattern about 10 miles from the memorial. I had asked our navigator, Eddie Mims to give me a hack when we were three minutes out. He must have misunderstood me because he gave me the hack two minutes out from the time we needed to be over the memorial Argh! We turned in, dropped the nose, raised the flaps and accelerated to 250 knots indicated. Luck is always better than skill and we hit the memorial exactly on time! Tempelhof tower came up and said 'Herky, your timing was perfect!' That made us all feel great.
>
> As many people know today, we were described as the 'Berlin for Lunch Bunch' and many of us have fond memories of those Jeager Schnitzels served at the guesthouses just across the street from Tempelhof airfield. During my time, the squadron had emblazoned on our shoulder patches the motto 'Eat Ice Cream or Die'. Probably coined because there was an ice cream stand right in the waiting area at Tempelhof where the crew gathered just before going out to the plane for the return trip to Rhein-Main.



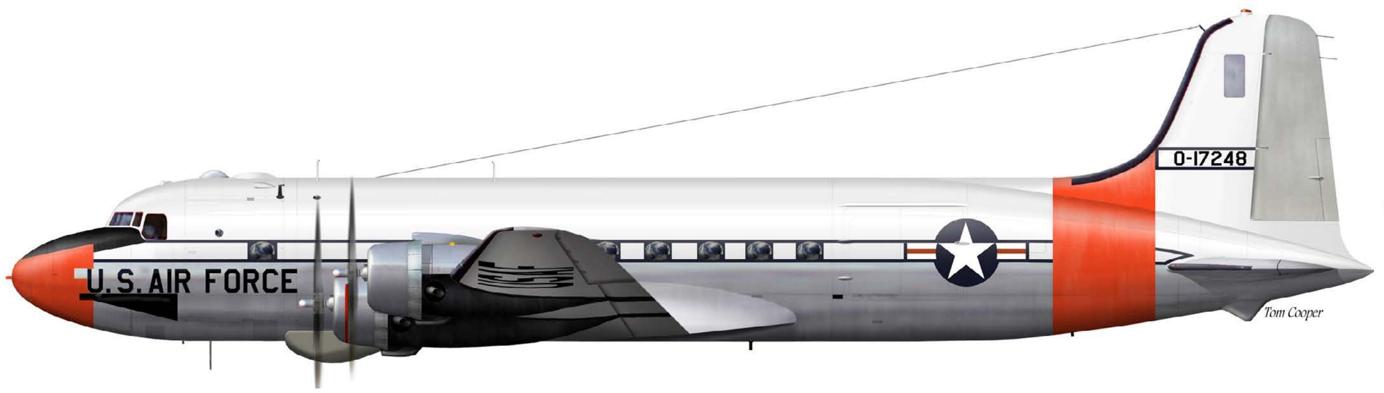
A 1983 aerial shot of Tempelhof AB. The tiny size of the C-130 on the apron shows how vast the hard stand area of the airport was. (USAF/Thomas Farr)



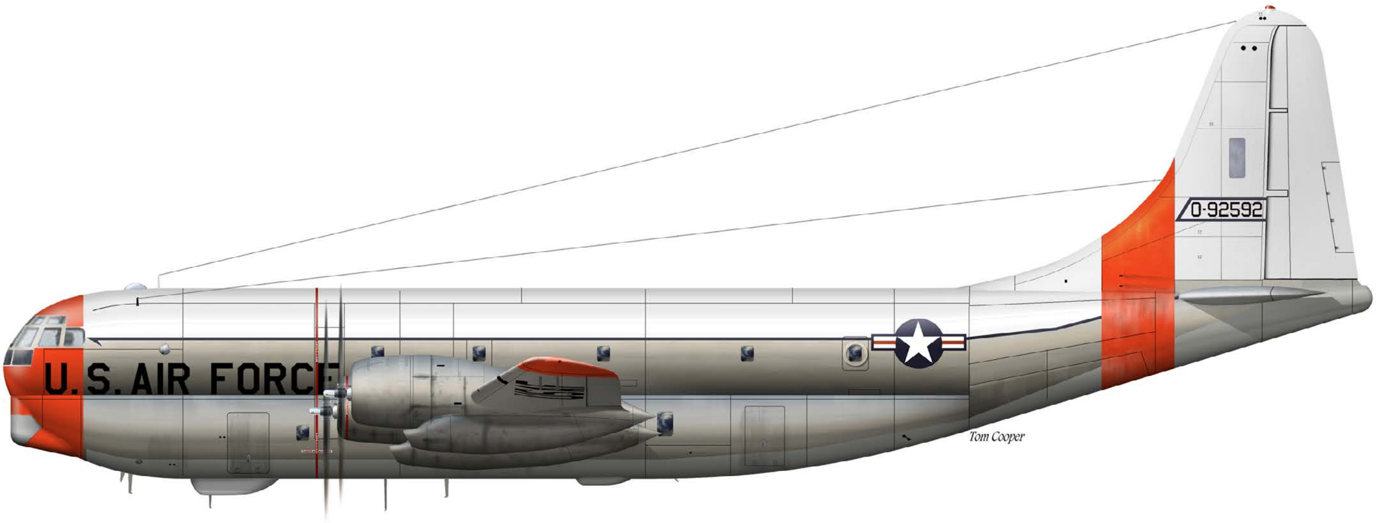
Several Boeing B-17Gs were converted to photographic platforms to fly post-Second World War surveys of Europe for Operation 'Casey Jones'. A few went on to fly covert SIGINT collection missions during the Berlin airlift and later, around the Western Bloc periphery, listening for Soviet radars. Like in this case, most had their armament removed, were left in bare metal overall and still displayed their war-time markings. (Artwork by Tom Cooper)



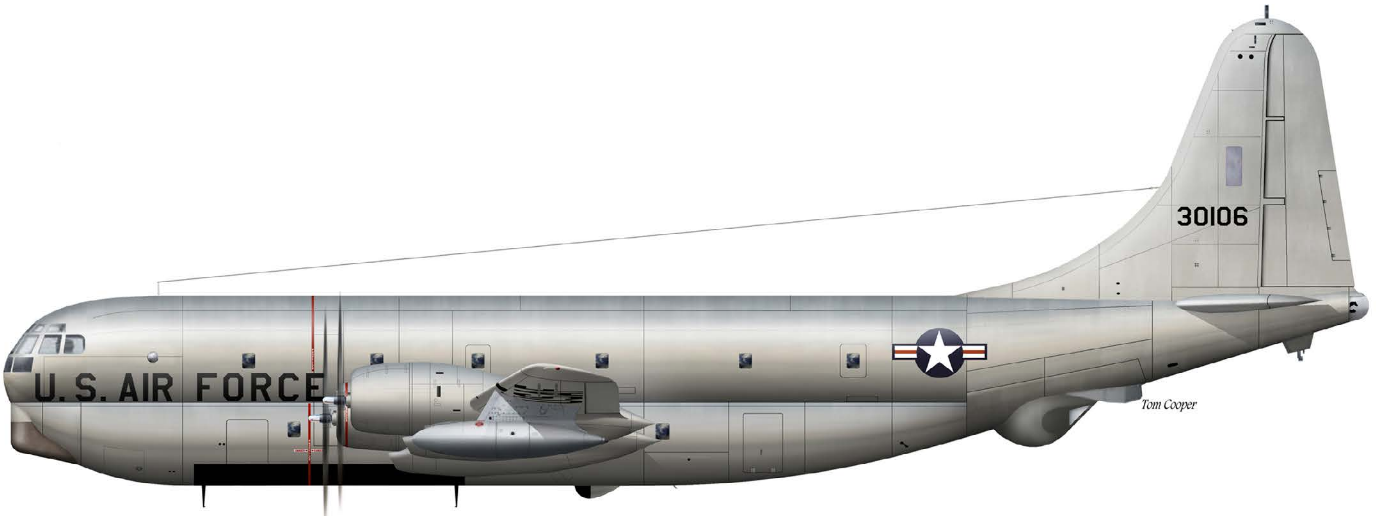
From 1948 to 1958, Douglas RB-26C Invaders flew as high-speed courier and VIP transport aircraft and – covertly – as photographic reconnaissance platforms along the Berlin and Vienna Corridors. The example illustrated here retained its war-time overall black livery and its original serial and was nick-named 'Hot Lips'. (Artwork by Tom Cooper)



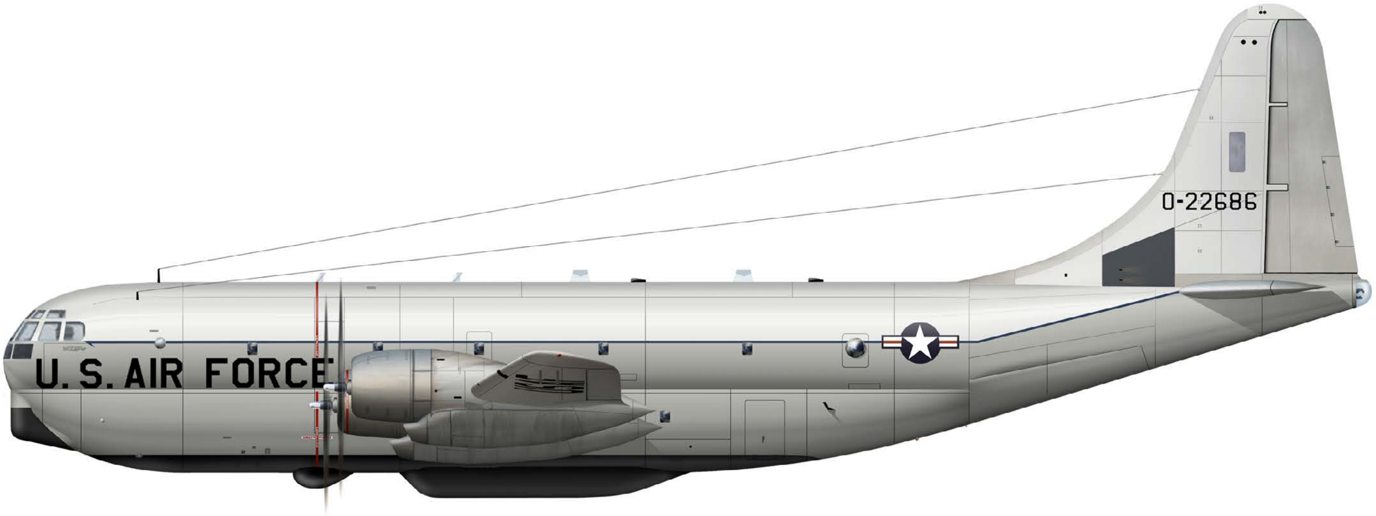
The Douglas C-54D serial number 43-17248 received the code-name 'Hot Pepper'. It was primarily a photo-reconnaissance aircraft equipped with vertical cameras and an oblique one that looked both sides of the aircraft. Subsequent modifications comprehensively equipped it as a signals-intelligence platform. (Artwork by Tom Cooper)



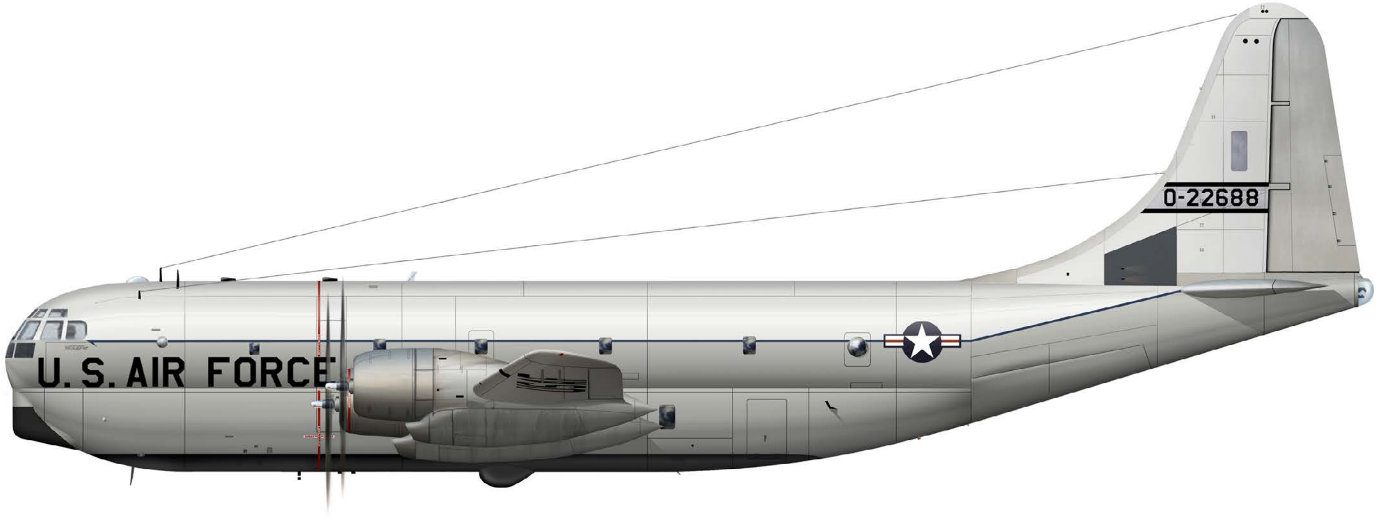
Code-named 'Pie Face', this early Boeing C-97A was equipped to carry the huge K-42 Boston Camera with its 240in folded optic lens. On missions into the Berlin Corridors it was restricted to a maximum altitude of 10,000ft (3,048m), well below the 30,000ft (9,144m) required for the K-42 to perform optimally. Notably, the lower portion of the aircraft was left in bare metal overall but the underside was painted in gull grey. (Artwork by Tom Cooper)



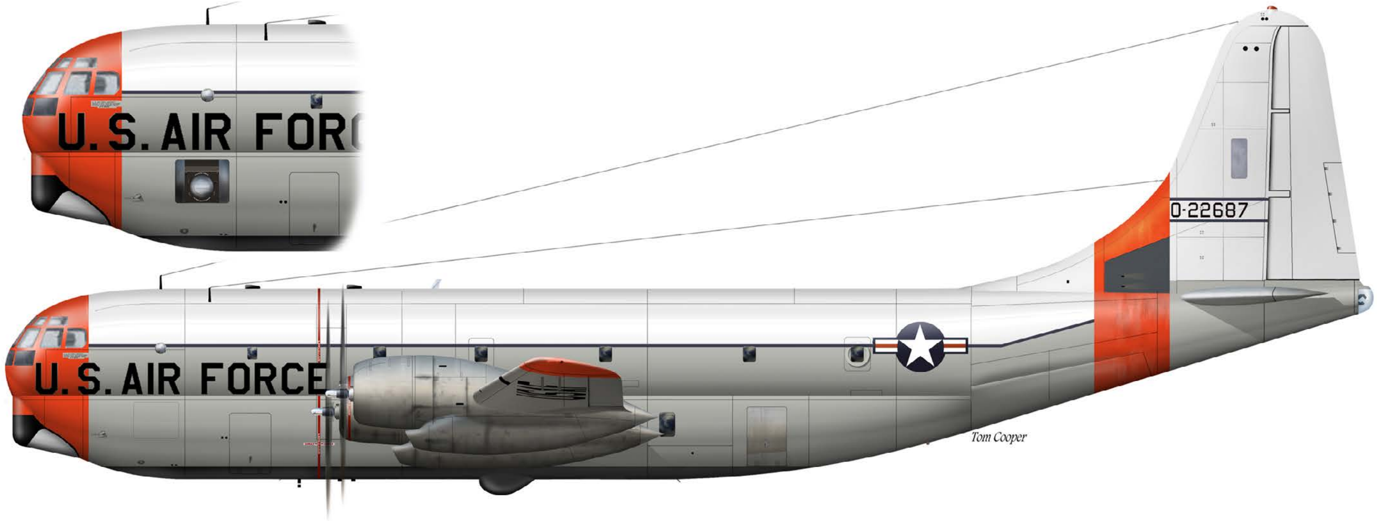
In service starting in the early 1960s and until 1975, this C-97G, code-named 'Wine Sap', was primarily deployed to measure characteristics and performance of Soviet radars along the Corridors and occasionally, elsewhere. The aircraft was left in bare metal overall and was also recognisable by its underwing drop tanks. (Artwork by Tom Cooper)



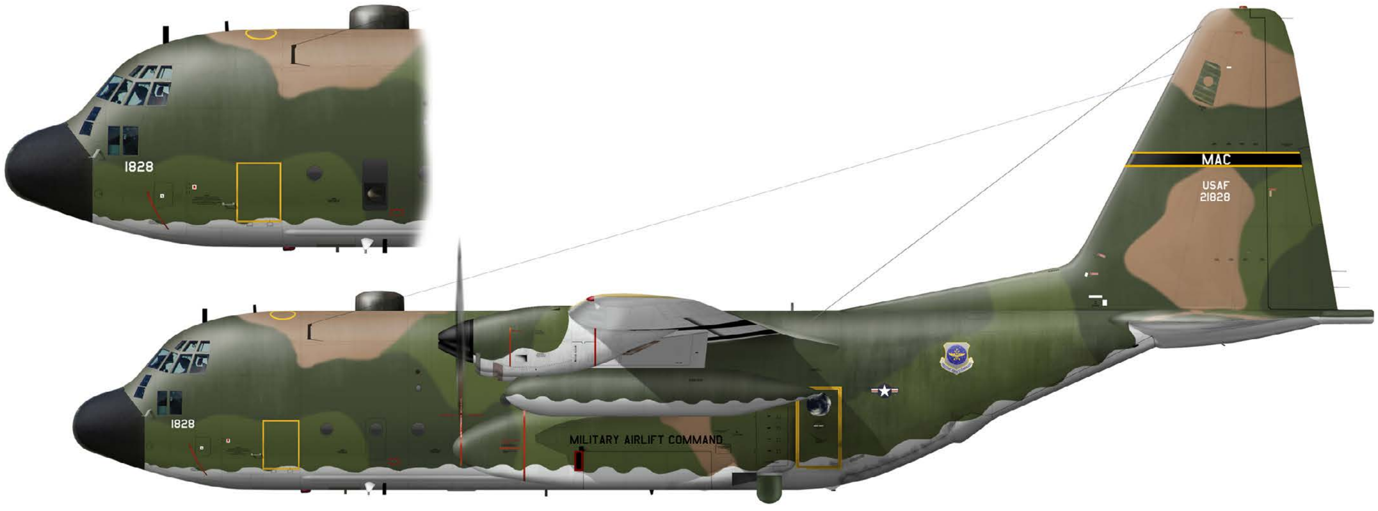
The big ventral canoe on the underside of the C-97G promptly betrays it as 'Rivet Flower' SIGINT-gathering aircraft. As such, it could not fly Berlin Corridor missions: instead, it mainly flew peripheral missions around the edge of Eastern Europe and in the Mediterranean. The aircraft was painted white along the top of the fuselage, gull grey on the sides and black along the bottom. (Artwork by Tom Cooper)



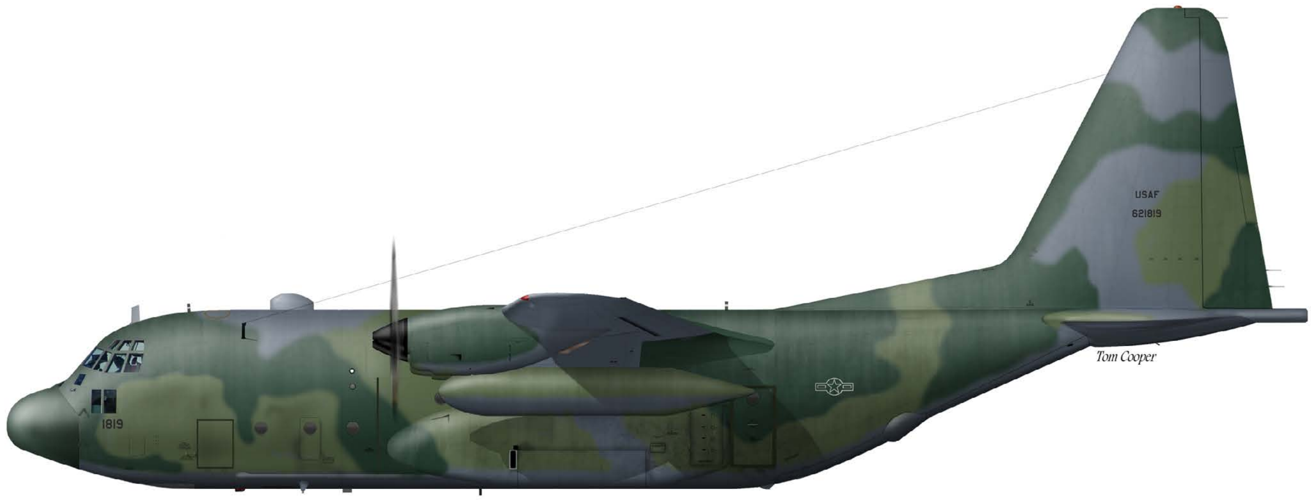
The C-97G serial number 52-2688, code-named 'Eager Beaver', flew Corridor missions from 1963 until 1969. It was primarily configured as a photographic aircraft and for this purpose it was equipped with several powerful oblique and vertical film cameras, and an early infra-red device. (Artwork by Tom Cooper)



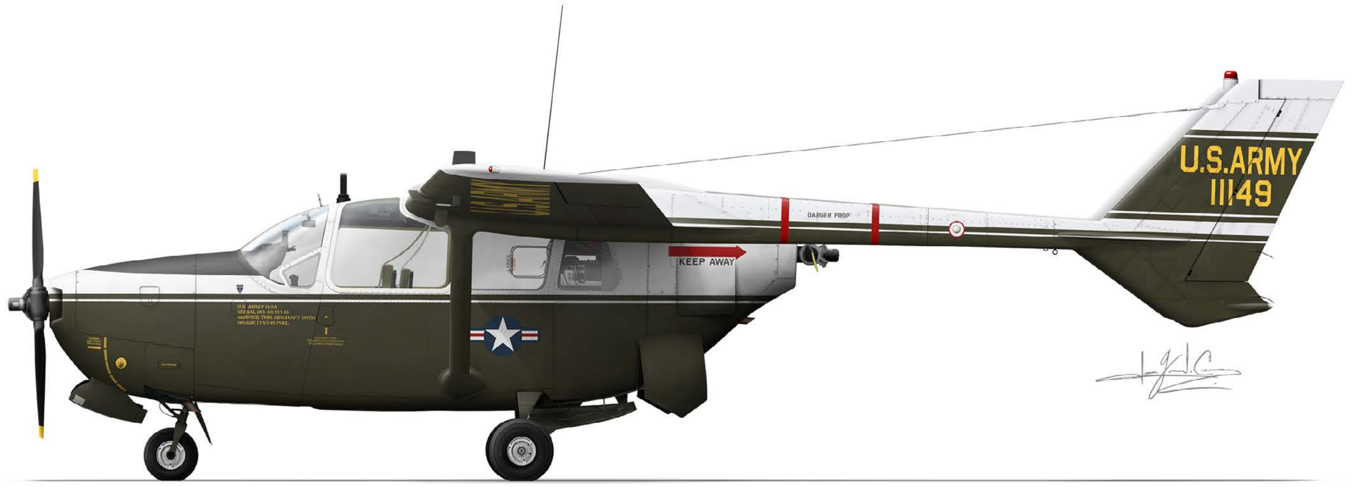
A combined photographic and signals intelligence collection platform, the C-97G serial 52-2687 was code-named 'Flint Stone'. It was first deployed to Europe in 1961. It underwent several modification programmes in the USA and in 1975, was the last C-97 to be retired from Corridor operations. Insert shows the open door through which the 'Big Item' camera photographed. A great deal of effort was taken to ensure than when closed, the 'secret' door perfectly matched the aircraft's external surface so to remain invisible to observers. (Artwork by Tom Cooper)



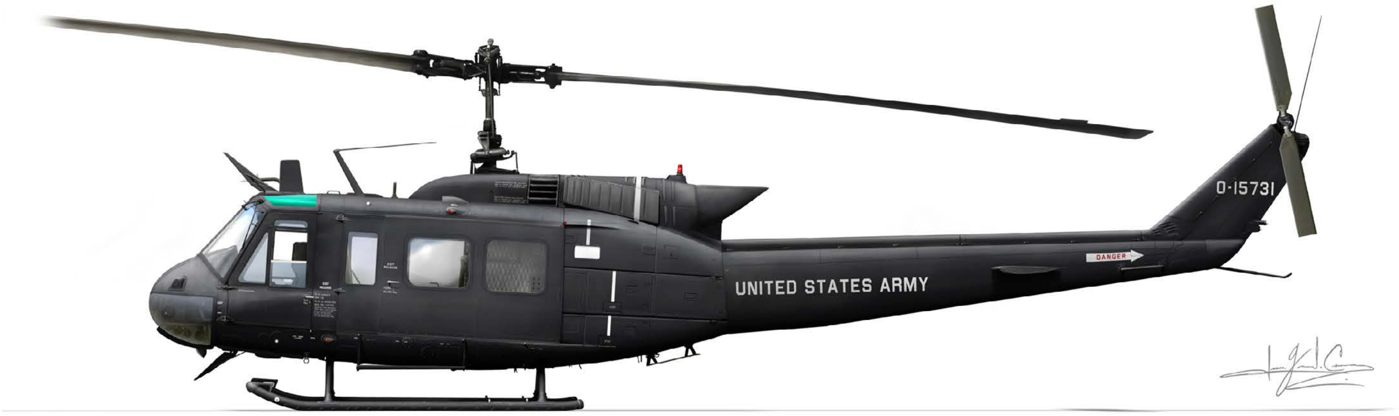
The arrival of the Lockheed C-130E 'Rivet Duke' brought a huge advance in electronic and optical sensor capability. This included installation of an extendable FLIR turret fitted in the rear of the cargo hold. The inset shows the optical glass panel as exposed: behind it sat the powerful 'Big Item' camera. As the C-130E approached the Corridor, the very effective concealing door was opened and the camera readied for operation. (Artwork by Tom Cooper)


USAF
621819
1819
Tom Cooper

By the mid-1980s, the C-130Es deployed for reconnaissance operations in the Corridors all wore the standardised European One camouflage. This helped maintain their cover, hiding among the standard C-130 transports on the Rhein-Main Air Base flight line. This example was the C-130E serial number 62-1819, equipped as 'Rivet Kit'. (Artwork by Tom Cooper)


U.S.ARMY
11149
DANGER PROP
KEEP AWAY

The Cessna O-2A served with the US Army Berlin Detachment from the mid-1960s up to 1971. Its unusual push-pull engine design and high-wing made it an excellent platform for observing Soviet and East German activities around the city. (Artwork by Luca Canossa)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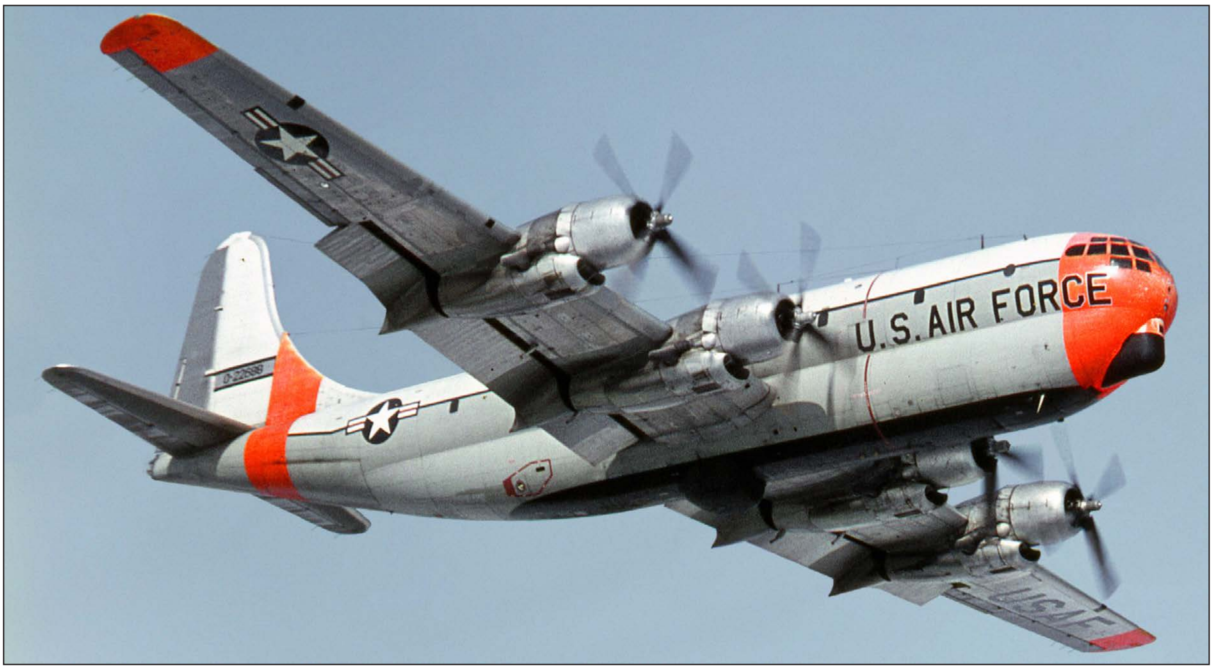
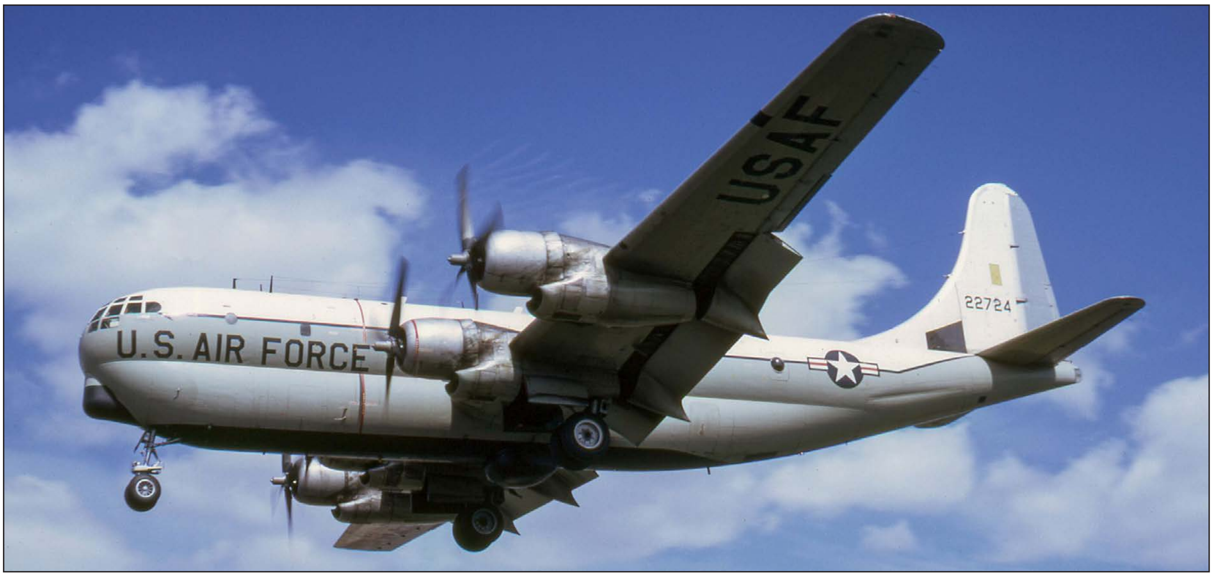
UNITED STATES ARMY
DANGER

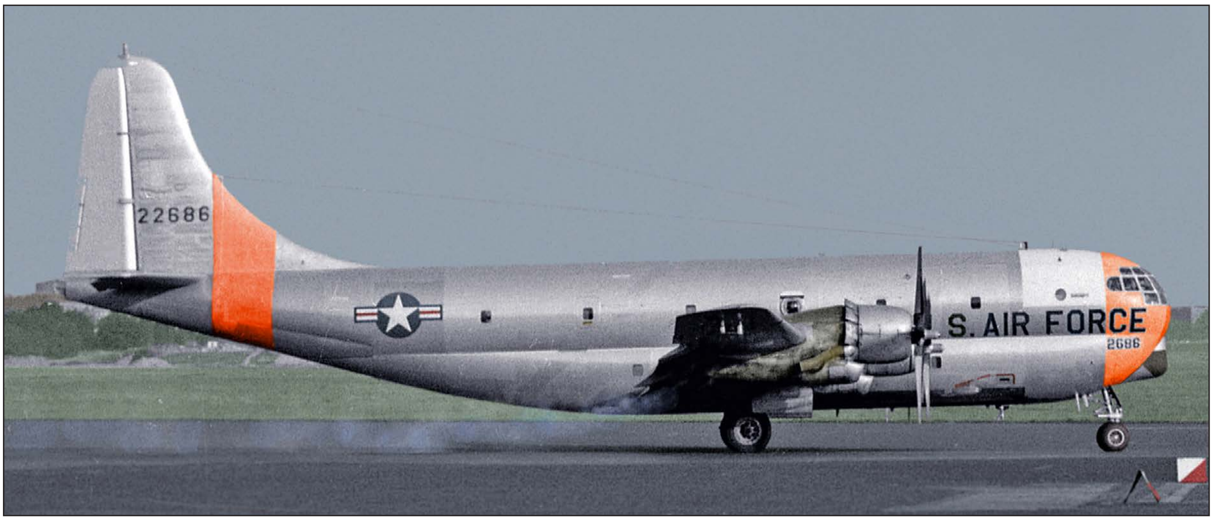
As well as using its UH-1s to observe activity on the other side of the Berlin Wall, the Berlin Air Detachment used some of its UH-1Hs, configured as VIP transports, to carry important Allied visitors on air tours of West Berlin. (Artwork by Luca Canossa)



Departing Tempelhof Airport with its cameras well-hidden, the C-97G serial number 52-2688 was code-named 'Eager Beaver' and operated by the 7405th SS starting in July 1963. After a depot-level modification in 1967, it returned to Germany with new equipment and was renamed 'Rivet Box'. (Photo by Ralf Manteufel)



Originally, the C-97G serial number 52-2724 arrived in Germany under the code-name 'Side Kick', in 1961. It later served in the Pacific theatre, before returning to Wiesbaden in 1969, with new cameras and the code name 'Rivet Giant'. (Photo by Ralf Manteufel)



Taxing at Tempelhof, the C-97G serial number 52-2686 operated from Germany for a short time around 1962 as an ELINT-gathering aircraft under the code-name 'Small Fry'. In 1969, it underwent another major modification programme and was later transferred to Israel. (Photo by Ralf Manteufel)

U.S. AIR FORCE
USAF

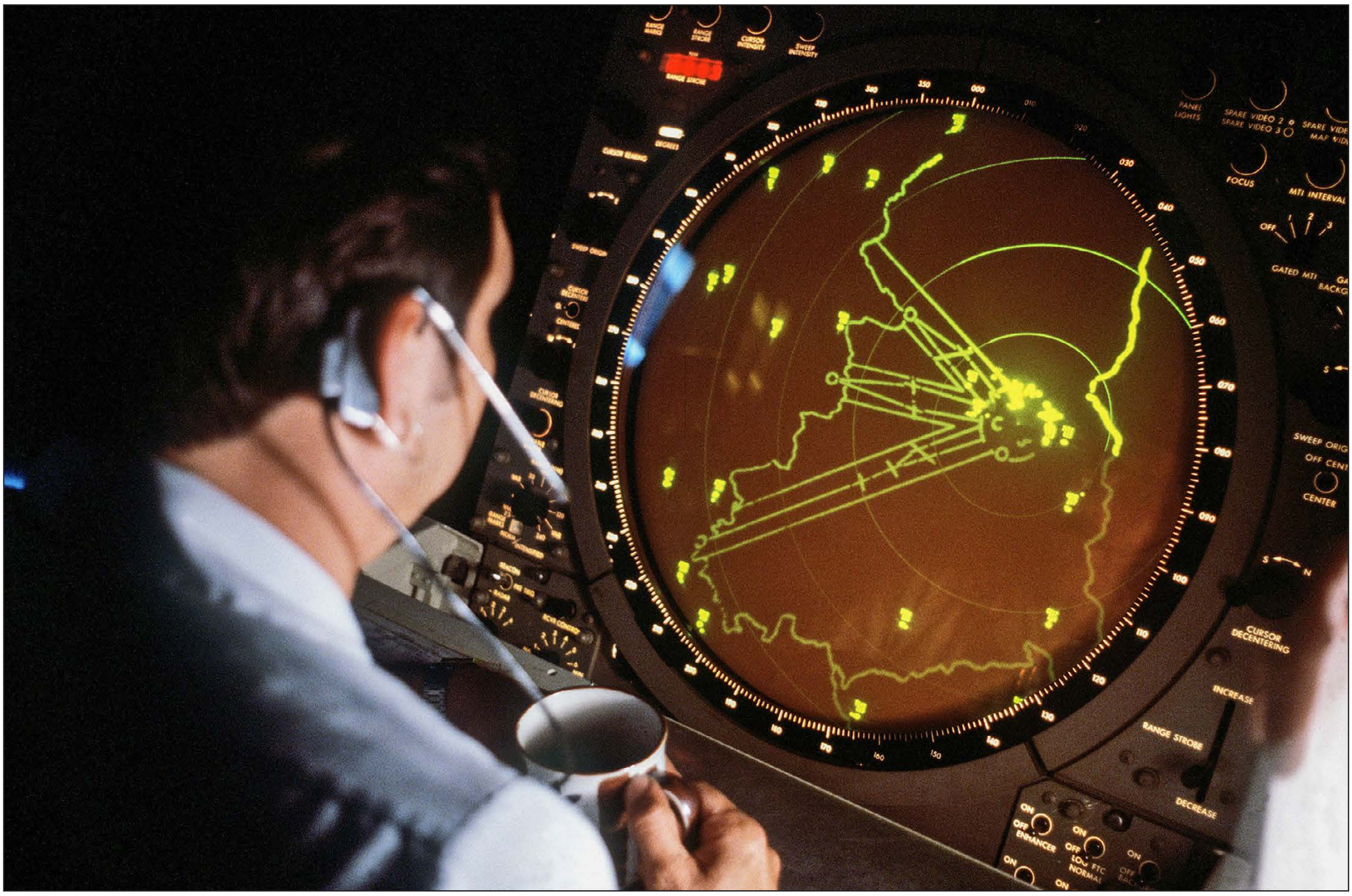
A Convair CT-29 'Carol Ann' as seen on departure from Tempelhof. Overtly operated as the Berlin air courier service, it transported few passengers and small freight items. All its reconnaissance equipment was carefully hidden behind concealed doors, dummy loads and underfloor. (Photo by Peter Seeman)

U.S. AIR FORCE
0-9190

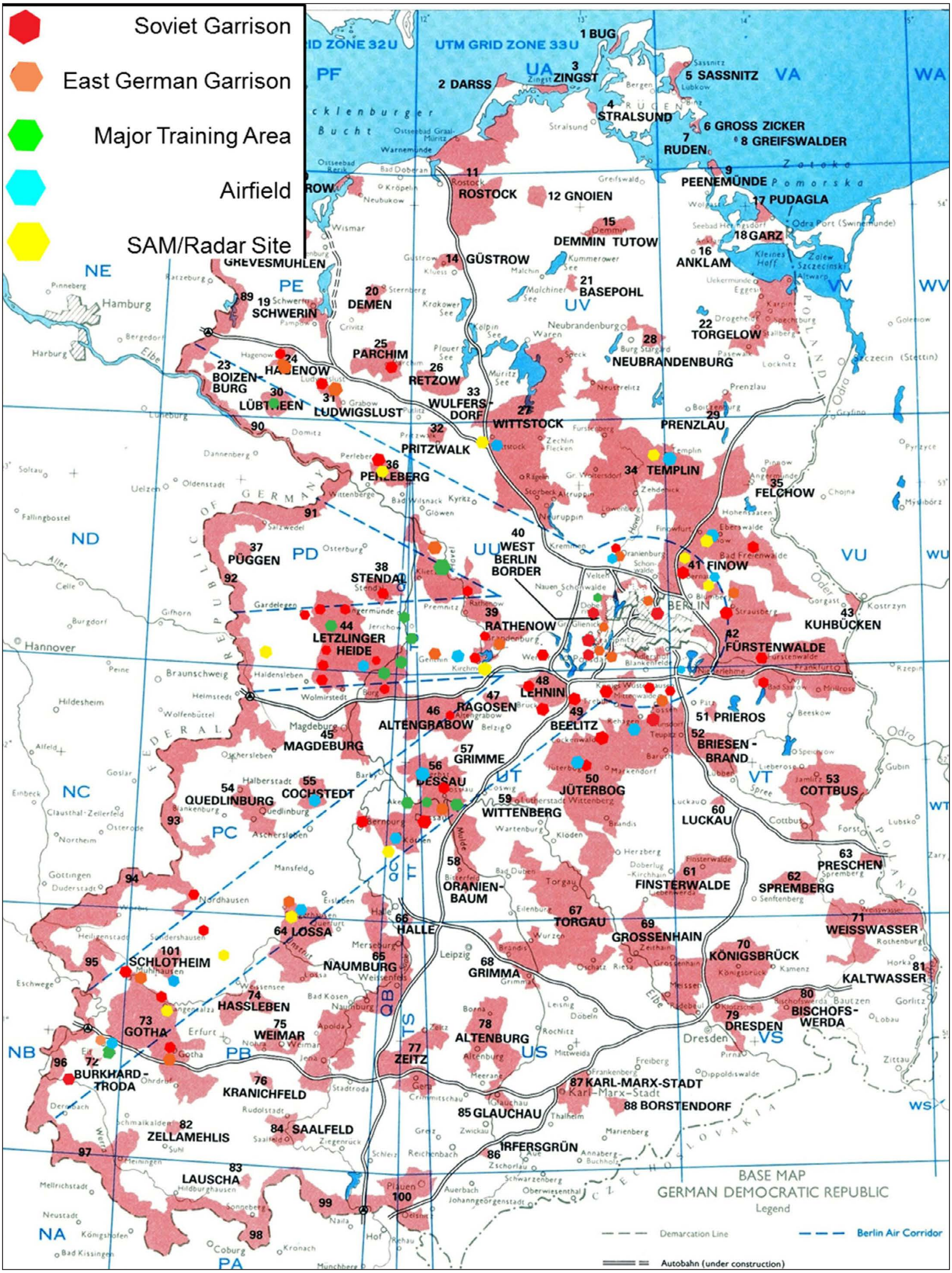
Over time, the sensor loads of the 'Carol Ann' aircraft gradually increased until they were unable to maintain level flight if suffering an engine failure. (via Lousherry Meyer)

U.S.ARMY
23253

The introduction to service of the very manoeuvrable Pilatus UV-20A Chiricahua in 1980 added a robust capability to US Army's Lark Spur missions over the BCZ. Easily able to operate at high crosswinds, serial number 23253 was photographed while landing at one of Tempelhof's taxiways. (Photo by Ralf Manteufel)



In the Berlin Air Route Traffic Control Centre, Technical Sergeant James Elmore of the 1946th Communication Squadron monitors air traffic flow in the Corridors and approaching Tempelhof, in 1982. (USAF/Thomas Farr)


Soviet Garrison
East German Garrison
Major Training Area
Airfield
SAM/Radar Site
UTM GRID ZONE 32U
UTM GRID ZONE 33U
1 BUG
2 DARSS
3 ZINGST
4 STRALSUND
5 SASSNITZ
6 GROSS ZICKER
7 RUDEN
8 GREIFSWALDER
9 PEENEMÜNDE
11 ROSTOCK
12 GNOIEN
GREVESMÜHLEN
14 GÜSTROW
15 DEMMIN TUTOW
16 ANKLAM
17 PUDAGLA
18 GARZ
19 SCHWERIN
20 DEMEN
21 BASEPOHL
22 TORGELOW
23 BOIZENBURG
24 HAGENOW
25 PARCHIM
26 RETZOW
27 WITTSTOCK
28 NEUBRANDENBURG
29 PRENZLAU
30 LÜBTHEEN
31 LUDWIGSLUST
32 PRITZWALK
33 WULFERSDORF
34 TEMPLIN
35 FELCHOW
36 PERLEBERG
37 PÜGGEN
38 STENDAL
39 RATHENOW
40 WEST BERLIN BORDER
41 FINOW
42 FÜRSTENWALDE
43 KUHBÜCKEN
44 LETZLINGER HEIDE
45 MAGDEBURG
46 ALTENGRABOW
47 RAGOSEN
48 LEHNIN
49 BEELITZ
50 JÜTERBOG
51 PRIEROS
52 BRIESEN-BRAND
53 COTTBUS
54 QUEDLINBURG
55 COCHSTEDT
56 DESSAU
57 GRIMME
58 ORANIENBAUM
59 WITTENBERG
60 LUCKAU
61 FINSTERWALDE
62 SPREMBERG
63 PRESCHEN
64 LOSSA
65 NAUMBURG
66 HALLE
67 TORGAU
68 GRIMMA
69 GROSSENHAIN
70 KÖNIGSBRÜCK
71 WEISSWASSER
72 BURKHARD-TRODA
73 GOTHA
74 HASSLEBEN
75 WEIMAR
76 KRANICHFELD
77 ZEITZ
78 ALTENBURG
79 DRESDEN
80 BISCHOFSWERDA
81 KALTWASSER
82 ZELLAMEHLIS
83 LAUSCHA
84 SAALFELD
85 GLAUCHAU
86 IRFERSGRÜN
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100 PLAUEN
101 SCHLOTHEIM
Hamburg
Hannover
BERLIN
FEDERAL REPUBLIC OF GERMANY
POLAND
CZECHOSLOVAKIA
BASE MAP
GERMAN DEMOCRATIC REPUBLIC
Legend
Demarcation Line
Berlin Air Corridor
Autobahn (under construction)

Original map used by British Liaison Mission (BRIXMIS) in East Germany, showing Air Corridors and virtually all the major military facilities. The red-brown blotches denote the Permanently Restricted Areas, supposedly off limits to the Allied Missions. (Crown Copyright)

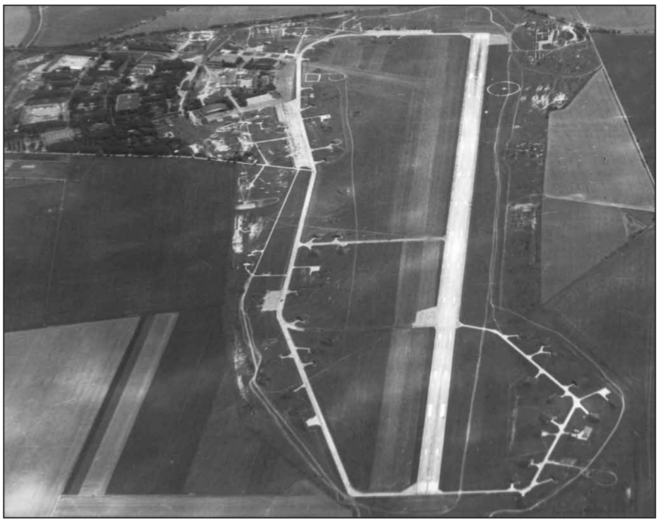
> Ice cream was the perfect ending to the great German lunches we experienced.

C-130 Navigator

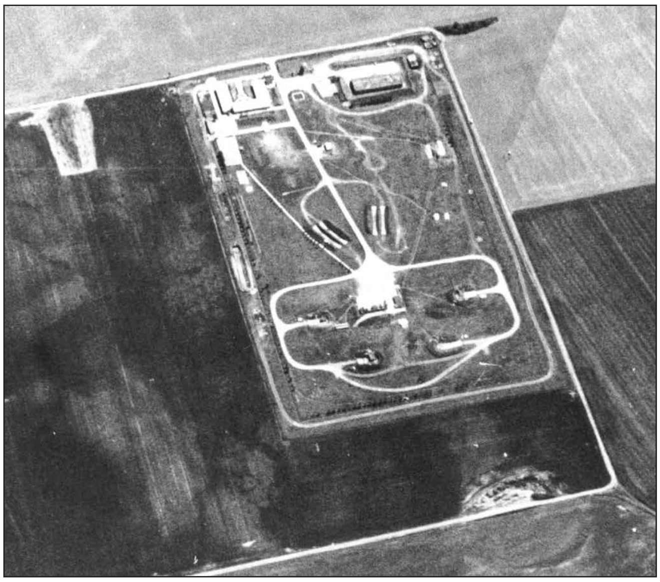
Captain Sam Baker arrived at Rhein-Main AB in early 1973 to fly as a navigator with the 7406th Support Squadron's Airborne Communications Reconnaissance Platform C-130B-IIs. He transferred to the 7405th and its C-97s at Wiesbaden in 1974 when the 7406th was wound up. In 1975, as the 7405th phased out its C-97s, he moved back to flying the C-130 again, this time the newly converted variants arriving for use on Corridor operations. Sam described his experiences flying the Corridors with the 7405th OS:

> Three of us former 7406th navigators stayed on to become the navigator cadre at Rhein-Main for the 'new' 7405th OS. As we'd all been C-130 qualified previously, it was easy for us to re-qualify as the unit moved in from Wiesbaden. Typically, individuals flew once or twice a week on scheduled missions with additional

Köthen Air Base was under the Southern Corridor and home to the Soviet Air Forces 73 GvIAP. It operated MiG-21PFs and then MiG-21bis between 1965 and 1975 when MiG-23MLD Flogger K arrived. In 1988, it converted types again, this time to MiG-29 Fulcrums. The airfields proximity to the Corridor meant it received plenty of coverage and the MiGs reciprocated by flying close to Allied aircraft.



Köthen was a busy Soviet airfield underneath the Southern Corridor and home to the 73GvIAP equipped with MiG-23MLDs. They operated from dispersed Hardened Aircraft Shelters along taxiways. Photographed with a hand-held camera from its Western end in 1978. (Sam Baker)



Approximately 7kms to the south-west of Köthen airfield was a SAM-3 site to provide protective missile cover. Photographed by crew member Sam Baker with a hand-held camera. (Sam Baker)

Many MiG-21 variants served in considerable numbers with Soviet and East German forces in the GDR including at Köthen. This MiG-21PF is now displayed at the Soesterberg NMM. (Dannis van der Heiden)

Finow Air Base was close to the north-eastern edge of the BCZ, from where this two seat MiG-23UB was about to depart in 1993 as Russian forces withdrew. MiG-23UBs were attached to many Soviet Air Force units, including the MiG-29 equipped 787 IAP at Finow. (Rob Schleiffert)

> training and proficiency flights as required. [Corridor flights] were a navigator's mission from start to finish. We were given a target list and priorities for the day. It was then up to the two navigators to determine how best to collect targets on the list given the prevailing conditions.
>
> When a new navigator joined the squadron, myself or one of the other instructor navs, would be responsible for their training. That was a kind of a long process, even though everyone that joined us already had previous C-130 experience, so at least they did not have to become familiar with the aircraft. They started their training by spending quite a few hours preparing the charts they would need for Corridor missions. On them, they carefully outlined in green ink every block of trees within the three Corridors, the Control Zone and beyond to a specified distance. All our recognised targets were marked and numbered too and when completed they were covered with plastic. (These were essential to the navigator's work during their period on Corridor operations.) After that, you could just use a grease pencil to mark the different targets for the day's mission and rub them out when you had done. Once you had your charts done, you could fly with an instructor nav. After a couple of months or so of flying, individuals were normally ready for their qualification ride and I would fly with them on a mission to hopefully, mission qualify them. Once we received the target list for the day, both navigators marked these on their own Tactical Pilotage Charts.
>
> Sam Baker continued:
>
> We were fully aware of the different mission tasks being performed in the back of the aircraft. We certainly kept their needs in mind as we planned the flight and their requirements were woven into each trip's mission profile.

Taking into account the forecast weather for the day and any special priorities for the mission, the two navigators coordinated the details of initial altitude, planned track through the Corridors, as well as entry and operation within the Control Zone. These were presented during the mission briefing. Once entering the Corridors, the situation could become very fluid.

> The navigators had to closely coordinate throughout the mission to determine attainable targets, any targets of opportunity and items of interest called out by the two Aerial Observers in the back. With all this in mind, we would call for regular altitude, speed, and heading changes throughout the mission. While we had great latitude in this regard, executing a 180-degree turn in the Corridors was expressly forbidden.

In the Corridors, the crew relied on their maps one hundred percent of the time:

> There was never anything like 'routine navigation' there, or in the Control Zone. You literally couldn't perform the mission without your own annotated set of charts. At all times, we had to maintain solid situational awareness of the aircraft's proximity to the 'red lines' and that was paramount. Nothing took higher mission priority than that.
>
> Selecting the best position from which to cover a target was always a function of altitude, distance, and weather. The lower you were, the more you could look horizontally into a nearby target. As we couldn't descend below 3,500ft we had to offset further away to achieve the best possible horizontal perspective. But now further removed from the target, meant it was always a trade-off between distance, ambient lighting, and weather. Travelling at two to three miles a minute, crews did not have a chance to over analyse what we were doing. We had no control over the weather or the light angles, we just did what we could. So, if you saw what you were after, that was great, but if not, you were past it and moved on to the next one. At the end of the day, you made decisions on the spot and let the analysts figure out later what worked and what didn't that day.
>
> Cloudless days were pretty unusual so:
>
> If the weather was good we were going to go the maximum 10,000ft limit, because it so seldom happened, just so we could see further as there were lots of targets outside the Corridors we were interested in. For example, if we were at 10,000ft in the Control Zone we could see to the Baltic even if we could not catch much in terms of useable imagery.

To help the navigators capture targets with the 'Big Item', on both sides of the flight deck immediately behind the pilots, were vertical pads on which were mounted two target sighting devices. Sam Baker explained:

> It was similar on both C-97s and C-130s. They were kept just behind the flight deck and were taken up there and mounted ready for use only after take-off. Operated by the forward navigator, it had a side adjustment that could be rolled up or down to adjust the aim point of the main camera which was slaved to it. They were always taken down again and stowed before landing.

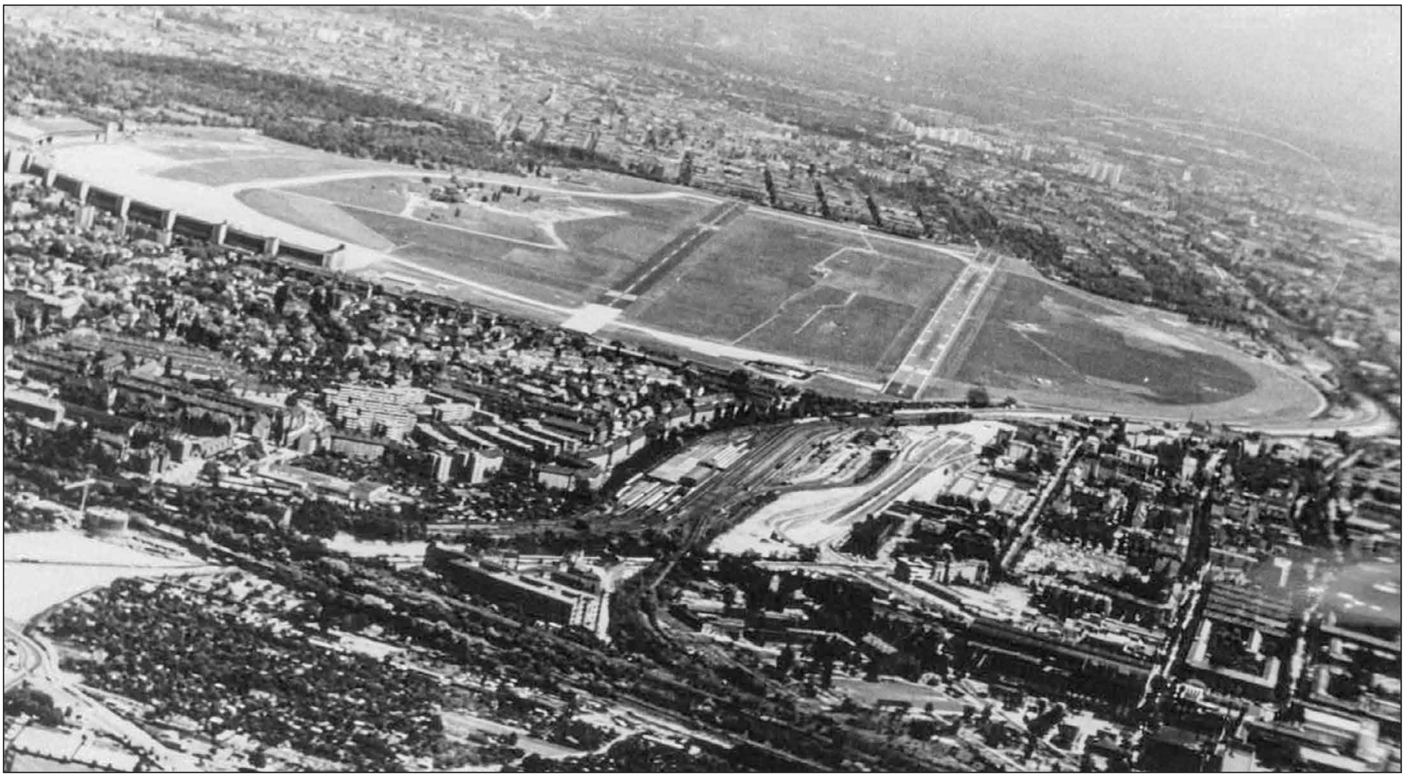
Planning for each flight had to be very flexible. Once on the ground in Berlin, new targets could be incorporated for the return leg. These would usually come from urgent observations by the AMLMs or other intelligence sources. Passed by telephone to Tempelhof, they could be incorporated into the return flight plan if possible. The navigators determined how best to amend the flight plan to achieve any new objectives. As Sam explained:

> You'd have never been qualified to fly the mission if you couldn't readily adapt to changes. Once we exited the Corridors on our return flight, standard navigation ensued. After landing there was a maintenance debrief and a conversation with the squadron intel folks if there was anything else to report.

Standards and Evaluation

Captain Sam Baker's tour time at Rhein-Main continued up to 1979 by which time he had moved up to become the Chief of 7405th Squadron Standards and Evaluation (Stan/Eval) and Deputy Chief for the 7575th Operations Group.

> I was responsible for the training, qualifying, instructor upgrading and flight evaluation of the squadron's flight deck crew members. A designated pilot trained and evaluated the pilots as I did for the navigators, although I was the overall squadron 'Chief'. At the time, I was the only navigator 'dual qualified' in both the Forward Nav and Radar Nav positions.
>
> I also assembled and administered the monthly closed book written examination, covering published Corridor procedures that all pilots and navigators had to take. There was a book of



A banking view from the flight deck of a 7405th C-130E on the approach to Tempelhof airfield. (Sam Baker)

> questions and I chose 20 each month. I did it myself first and then they had to come in and take it. Failure to pass this monthly exam would restrict your flying until it was retaken and passed again. I reported directly to the squadron commander.
>
> For Corridor missions, breaking the 'red line' rule (going within one mile of the edge of the Corridor) was professionally damaging for navigators and pilots. It did not occur often, but when it happened there were costly consequences for those responsible. At a minimum, this resulted in immediate grounding and mission decertification that was followed by remedial training and re-qualification. If further investigation revealed a serious breach of the rules, it could additionally result in position downgrading within the unit or even complete removal from the squadron. All of these outcomes occurred during my tenure.
>
> Navigators did two check rides a year. The first was a navigation proficiency check that would be done on a training flight using one of our aircraft. For example, we would fly out from Rhein-Main cross to the English Channel and go down to Lands End on the Cornwall coast, then head across the Bay of Biscay so that we were over water for some time. That was the only place you could demonstrate your navigational proficiency using astral shots and which you could simply never do over the continent because the airspace was too crowded.
>
> We landed at Torrejon AB in Spain, spent some time there and do the trip in reverse home. It was the same sort of check ride a regular airlift C-130 navigator was familiar with.

As Deputy Chief of 7575th Operations Group Stan/Eval, Sam also sometimes performed annual, in-flight proficiency checks for navigators from the 7th Special Operations Squadron. The second ride in the 7405th was a 'mission qualification flight':

> We briefed them beforehand on what they needed to do and what was expected of them. I just sat in the back, kept quiet and let them fly the mission, and did not intervene unless something went badly wrong. Primarily, I was concerned about how close they got to the red lines, as well as their targets. After completion, we debriefed, pass them or recommend some remedial training and check ride them again later. We also did some no-notice mission check rides. Crews would turn up for their mission and we were simply with them for the day.

Whilst the pilots and navigators ensured the C-130s got to the right place, stayed safe and were within the 'red lines', it was the rear crew sensor operators that could turn it into a successful mission by capturing the assigned photographic and electronic targets of the day.

5

AIRBORNE SENSOR OPERATORS AND PIS

Special Equipment Operators and Photo Interpreters of the USAFE Special Support Team (USST) were a key part of Corridor operations. Their technical and equipment recognition skills were central to the collection of imagery and turning it into useable intelligence. However, their skills were not just utilised on the ground at Schierstien, many did spells flying Corridor operations. USST typically consisted of 10 plus personnel, mostly USAF, headed by two officers. The Air Force members were normally supplemented by a few US Army and US Marine Corps representatives.

Special Equipment Operators

Dennis Brookins served in the 7580th OS from November 1982 to November 1986 as a Special Equipment Operator (SEO). He had re-joined the Air Force after a break in service.

> I became an Aerial Photographer, having previously worked for seven years in Security Police specialisation. I was assigned to the bombing range at Edwards AFB and operated optical instrumentation cameras for flight testing. We manned observation towers to triangulate where their bombs landed. Once we had completed ground base training, passed the qualification tests, completed survival training and so on, we would get airborne. Newbies started out flying in the back seat of T-38 trainer aircraft then A-37s, F-4s, KC-135 and various helicopters.

Dennis got to photo chase fairly new service aircraft like the F-15, F-16, A-10, B-1, KC-10 and take part in cruise missile evaluations. After surviving a T-38 nosewheel collapse and an Army helicopter crash after it lost power, he was assigned to Germany. He continued:

> During my time frame, about half of the SEOs at Rhein-Main came from along the same 'pipeline' that brought them directly from Edwards AFB. [On arrival at Rhein-Main.] After my security clearances were confirmed, I was briefed on the mission by the Chief SEO. He also explained to me I was no longer a 'photographer' but a loadmaster. I was assigned to 7580th OS but worked out of the 7405th OS's two-storey building. My first task was making coffee. I did that for two days, but it was so weak, I never had to make it again.

In addition to their main job, everyone had secondary duties too and his was as the squadron chemical warfare NCOIC, maintaining the chemical warfare suits, masks and equipment.

> I spent about two to three weeks doing ground training, working on mock-ups of our equipment, learning how to load cameras and operate the equipment panel in the back of the aircraft. We normally had a crew of two SEOs, a primary operator and an assistant. After about six months of in-flight, on the job training, I was certified as an SEO. Normally new crew members that flew into Berlin, for first time, had to buy the first round of drinks for the entire crew. That was a tradition carried on for many years.
>
> Our actual training was rather a mixed bag. We had two different Senior Chiefs as trainers who did things in completely different ways and we had to remember the different routines of each. Doing a task one way would satisfy one Chief but annoy the other and vice versa. Once training was complete, I combined the best of both approaches and later, when I trained others, I tried to do the same.
>
> Once we were airborne, we prepped everything and operated the equipment from our SEO panel. As we approached the Corridor, we were told to open up the outer panels that concealed the photographic windows. On our control panel, we had to adjust the cameras' settings to suit the aircraft's speed, altitude and so on to ensure the cameras were fairly well focused when the cameras were turned on. It was easy to take things for granted, get bored and overlook the necessity to keep updating the equipment settings for the frequent changes in aircraft speed and altitude. I always did this, it was important as it produced major improvements in the sharpness and clarity of pictures.
>
> As we closed on the Corridor, we took the aiming instrument to the navigator on the flight deck. This enabled him to slave the 'Big Item' sideways-looking camera to his target. Any of the crew members looking out windows, especially the Aerial Observers, could tell us to turn the Pan camera on to capture any targets of opportunity. I remember being very busy during the autumn months when the Russians and East Germans conducted their annual exercises and the Russians did their troop rotations.

Dennis, like many other Corridor crew members, recalled one winter seeing:

> … placards in snow, on the ground over East Germany that said in English 'Merry Christmas, 7405th'. Who placed them there, I guess we will never know.
>
> One time, while flying back through a very heavy thunderstorm, my panel got hit by lightning. It knocked me down, but I was otherwise uninjured. During flights, we would often joke on the intercom and we frequently graded our pilot's landings. Some pilots were gentle, others slammed the plane onto the ground. I would say 'that was a three-pointer, or slam dunk'. Some of the pilots would get mad, others just stayed silent. I learned as an aerial photographer to have a sense of humour. If not, you would not have climbed back inside the aircraft after some of the more scary missions.

John Stephenson began his basic training as a USAF Photo Interpreter at Lowry AFB, after which he was posted to the 497th RTG at the Schierstien compound, close to Wiesbaden in July 1985. Once there, the new PIs had to complete the Advanced Imagery Interpretation Course (AIIC) where they learned to identify all types of Soviet and Warsaw Pact military equipment. He explained how one day he was taking a short break when 'I looked out of a window on our stairwell landing outside our classified area and saw some guys walking around the compound in flying suits'. Being curious, he became very interested in who they were and found out about the 'flying team'. 'I asked how I could get onto flying status. The first step was to work on the East German team exploiting Corridor imagery. I managed to do that and worked on second phase imagery reports, with hopes of joining the flying team down the road'.

> I joined about four others working the night shift, from around 2100hrs to 0400-0500hrs in the morning. We looked through and read out the imagery from that day's mission. They shot about two to three 2,000ft rolls of film dependent on weather and ground activity levels. This was a mixture of oblique imagery from the 'Big Item' and panoramic (Pan) imagery. The processed film from each roll was cut into four or five 500ft lengths of Pan and oblique imagery. Someone else exploited the infrared FLIR recordings and the imagery from the AAD-5 camera that shot directly underneath us and tracked our route.

Working through the night they noted the locations, equipment types and activities the cameras had captured for the IPIR.

> I liked doing the oblique photography of the targets inside and outside the Corridors. We assembled target folders with

the photographic material collected. This material was not as neat or precise as the material the Brits' 6 Intelligence Company produced. Their record-keeping was very thorough, they seemed to very carefully track every movement they could. That may have been because we only stayed in Germany for about two years, they often stayed much longer and were really on top of it.

We wrote the information for the paper target folders and then someone else would enter it into our Computer Aided Tactical Information System (CATIS). Once the completed information had been assembled at the end of the shift, the whole report from that night would be sent via our distribution team and disseminated to agencies in the intelligence community, the Brits and others on the list.

The Schierstein *kaserne* compound, close to Wiesbaden, was home to the 497th Reconnaissance Technical Group. Part of their work was handling and assessing imagery from Corridor missions. (USAF)

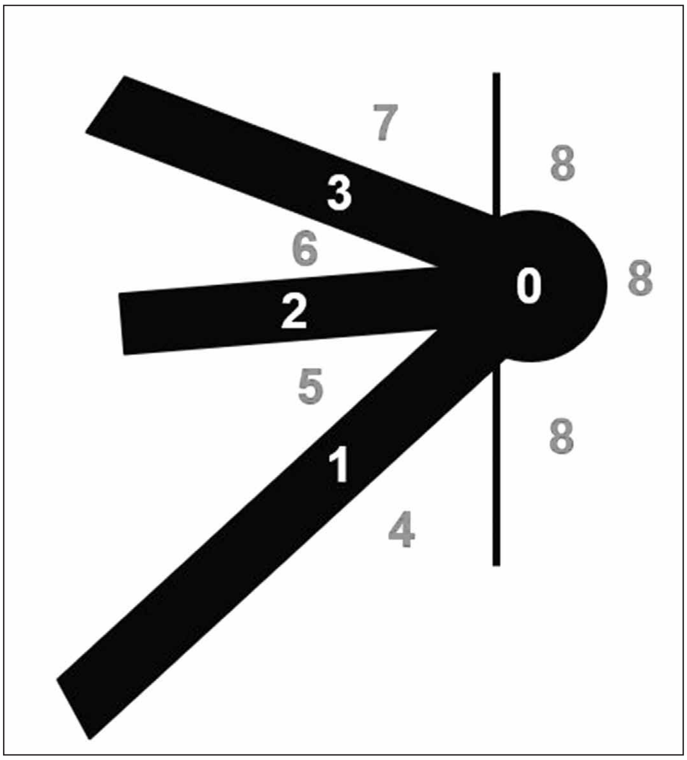
The Flying Team

To join the flying, team aspirants had to pass a flight physical and find lots of extra time for additional studies.

> There was a group of us who were all single and as soon as we finished out night work, we stayed on until about 1000hrs. We worked in a room on the third floor of our building, going through rolls of imagery, kept for training as study materials. From that, we became familiar with the targets in each of the Corridors and to each side of them. [When it came to being tested, the examiners] would run through some film and ask us where we were. We had to be able to identify which Corridor we were in if we were flying east or West and know the other targets close to the area we were looking at. Also, to correctly identify the type of equipment and know if it was Soviet, East German NVA or VoPo.

John joined the flying team in March 1987 and he described the process of a typical sortie to illustrate many of the aspects involved from a PIs perspective:

> We usually flew Monday to Friday. We mostly avoided weekends and major public holidays to help maintain our fiction as being courier and liaison aircraft. We would arrive at Schierstien at around 0400/0500hrs in the morning and talk with the IPIR team to see what they had found from the previous day's mission. We went through the message traffic, at that time from a system called MAXI (Modular Architecture for the Exchange of Information). From that, we could see what the Brits and other US units were reading out and look for tips on some activity or exercise that looked due to happen. We would do that for about an hour or so. Then the four of us; the FLIR operator, FLIR scribe, left and right scanners would drive to Rhein-Main and meet up with the 7450th flight crew.



This schematic shows how the numbering system for Soviet and East German targets along and around the Corridors and BCZ worked. (Sam Baker)

The 497th RTG, ostensibly a non-flying unit, had been following this routine for many years – each weekday four men left the compound in flying suits. That surely would have made any observer curious as to why a ground unit had men in-flight suits attached to it? John recalled that around February 1989, a member of HQ USAFE suggested they should improve their operational security. 'We started to come in and leave Schierstien wearing our usual Battle Dress Uniform and then change into our flight suits once at Rhein-Main. Like we were going to fool anybody by doing that! A tail could just follow us the 25kms or so to Rhein-Main and watch us enter the base'.

ALTES LÄGER AIR BASE

Close to the point where the Southern Corridor joined the BCZ, about 38nm SSW from the BASC building, is the town of Jüterbog. During the Cold War, there were several Soviet and GDR military facilities nearby. Most obvious from the air was the Altes Läger airfield. Developed as part of Nazi Germany's expansion programme, it was taken over by the Luftwaffe in 1933. In May 1945, it was overrun by the Red Army.

From 1953, it became the home of the Soviet 16th Air Army's, 833rd IAP, Fighter Aviation Regiment, part of the 126th Fighter Aviation Division. In 1961, it flew MiG-21s, which were replaced with MiG-23s in 1979. The airfield site comprised an 8,500ft runway, hangars, a dispersed hardened aircraft shelter complex and a helicopter area south of the runway. Just to the north and adjoined to the main airfield, was the large camp, with a linked logistics and domestic site. As was the sprawling habit of Soviet military architecture, an ammunition dump was later added to the northwest with a small 'new camp' a little off the eastern end of the runway. Less than four miles off the Western end of the runway, was a small SAM site at Eckmannsdorf /Lindow.

In the 1970s, a six-place helicopter parking spot site was added just north of the main aircraft platform and alert and turning loops were added to the end of runway 28 during the 1980s. Like many Soviet facilities, it could be served by the nearby rail line, in this case, that between Treuenbrietzen and Jüterbog. By 1991, the 833rd IAP was equipped with 26 MiG-23MLD Flogger Ks and six MiG-23UB Flogger Cs. The aircraft returned to Russia in 1992.

Within 30kms of Altes Läger, were another six other airfields at Jüterbog-Damm (an unpaved strip), Reinsdorf, Sperenberg, Kummersdorf, Lüsse (Bad Belzig), Holzdorf, Neuendorf (Brück) and Helipad HSLP/HLP 1030 at Wittenberg.[1] There were many more military installations close by and the military training areas at Forst Zinna just to the north, Heidenhof-Goimberg just beyond it and Glücksburger Heide to the south-east.

As well as being the target for Corridor aircraft, Altes Läger was regularly observed by US satellites that tracked most of the major structural changes from coverage that began in 1961. Perhaps as a result of this long term surveillance effort, most of the layout of Altes Läger airfield was scraped into the desert at 'Range 76', of the Nevada Test and Training Range by 1976 to be a representative

Altes Läger airfield was home to the Soviet Air Force's 833 IAP with MiG-23MLD 'Flogger Ks' photographed in 1991. (Eric Bannwarth)

Once at Rhein-Main, the four sat down at a flight planning table with the aircraft navigators and a member of the EWO team, to go over the plan for the day.

> The Imagery Objectives Requirement List, detailed the targets that required routine coverage on a daily, weekly, quarterly, biannual or annual basis. From that and any tips we had, we would come up with our plan for the day. We usually went in one Corridor and out on another. But sometimes if it was advantageous to us, we might fly in and return down the same one. The EWOs would say that they needed to cover a certain target or be a distance away from another target, so we all tried to build their requirements into the plan too. However, it was imagery requirements that drove the programme, because we needed clear weather for good photography, whereas cloud made little difference to the electronics.

In addition to the standard flight safety briefing, the crew were also instructed what to do in the event of a forced landing in the GDR. In that situation, the crew were told to destroy the aircraft using flares and hydraulic fluid if at all possible. 'Once our plan was agreed, we would break and get breakfast'.

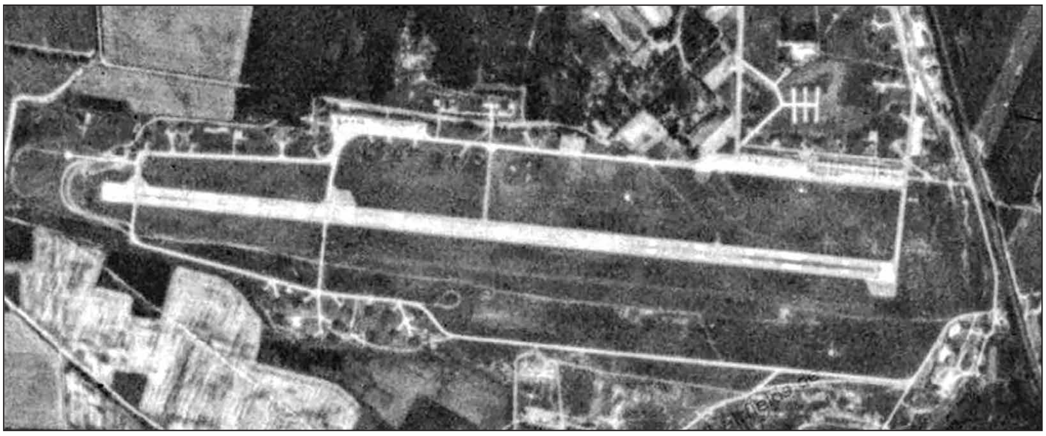
Robert Zoucha joined the USAF in July 1981 and after completing his Combat Cameraman course, went to Goodfellow AFB. He joined the 7575th Operations Group to serve as an SEO from July 1984 to September 1986 and completed 206 Corridor missions. He explained that a single mission per day was the norm although a second flight by an individual aircraft and occasional multiple aircraft missions both day and night were not uncommon at times when Soviet forces were very active.

> We often boarded the aircraft between 0800-0900hrs, got ourselves settled and did a communications check before engine start-up. For the IR camera to work, the FLIR head had to be cooled and that took some minutes. It would be started so that by the time we were airborne, it could soon be lowered and turned on if we needed it. The EWOs could start using some of their equipment to sniff at least some of the airwaves before we even left.

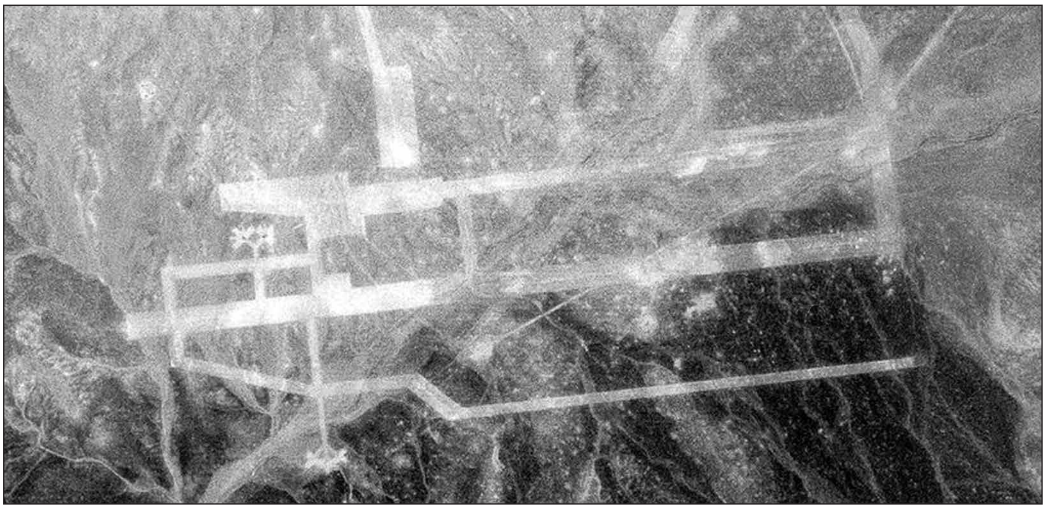
Squadron aircraft used 'Herky' call signs, the same as standard C-130 transports for training flights and 'Ask' for operational missions.

After departure from Rhein-Main, the SEOs took the special aiming sights for the 'Big Item' to the flight deck, placing them on mounts behind the two pilots' positions. John Stephenson added:

> As we got close to the Corridor, the Texas Instruments SPF-1 (Special Purpose FLIR No 1) would be extended and we were ready to start work. It did not have all the data displayed you see on modern systems; it was just like a regular TV screen. If you needed to observe something specific you had to know the Corridors inside and out and know where it was. The SPF-1 had



In June 1980 a KH-9 Hexagon satellite (Mission 1216) captured this image of Altes Läger airfield showing the major features of its layout. (USGS)



A copy of Altes Läger airfield was scraped into the Nevada Test and Training Range by 1976. 'Range 76', sometimes known as the 'Tolicha Peak' or 'Eastman Airfield' was used as a target for aircraft taking part in Red Flag exercises. (USGS)

target for US aircraft taking part in Red Flag exercises at a location sometimes known as the 'Tolicha Peak' or 'Eastman Airfield' target airfield. Since then, it has been 're-landscaped' to look somewhat different.

> both a white and a black hot control. I think it had three levels of zoom, low, medium and full, which you clicked in and out. From close-ups, you could identify individual vehicle types et cetera. Sometimes, with fog and other weather, you could get thermal crossover and that made the job much more difficult.
>
> Training to use the FLIR consisted of really just reading out the FLIR IPIRs from the missions. Then, it was learning what the individual control buttons were when you got on the aircraft. The FLIR data was recorded and as we progressed along the Corridor, we also gave a commentary for the tape and simply say what it was we were looking at and the time. Some operators would rapidly zoom in and out of the target and afterwards, it could be pretty difficult to see what it was you were looking at, even though they told you. I was pretty mindful of that and so tried to give a good long look at a subject before changing the magnification and gradually slew the camera around.
>
> As the aircraft progressed down the Corridors they regularly changed course to line up on the next target but had to stick to their planned route pretty carefully. One significant restriction was that once aircraft were in the Corridor, we were not permitted to turn back, even to avoid severe local weather.

Robert Zoucha was twice onboard C-130s when the aircraft was struck by lightning because they were not permitted to turn back.

Pilot Colonel Jon Martin explained that:

> The cockpit layout of the Corridor aircraft was pretty much that of a standard C-130, except for a couple of additional switches. This included a red guarded toggle switch used to retract all cameras and doors in the event of a close encounter with another aircraft or some other emergency. It was only used in case of dire need, with a call to the back of 'FLIR, Bring it in!' that was enough to get reconfigured in time.

Robert Zoucha described the arrangements for rare occasions when the aircraft had problems, such as being unable to close camera hatches or retract the FLIR ball. Depending on what sensor was affected, it was normally considered unwise for the aircraft to return to Rhein-Main where it might be unacceptably exposed to public view. Instead, the aircraft went to nearby Ramstein AB where a special C-130 sized hangar was kept ready for such contingencies. The aircraft would report 'Maggie's drawers are down' and divert to Ramstein AB. After landing, it taxied directly into the hangar before finally shutting down all the engines, so the hangar doors could be quickly closed behind it.

There were around seven EWO or 'Raven' positions onboard C-130s. Two were occupied by Russian and German linguists for COMINT intercepts. They paid close attention to Soviet and East German air defence network communications and the operators provided real-time warnings to other crew members when they believed the C-130 was likely to be intercepted or threatened. The remaining positions were manned by ELINT operators listening out

ZERBST AIR BASE

Directly under the Southern Corridor, Zerbst was a Soviet airfield that received very regular photographic coverage.

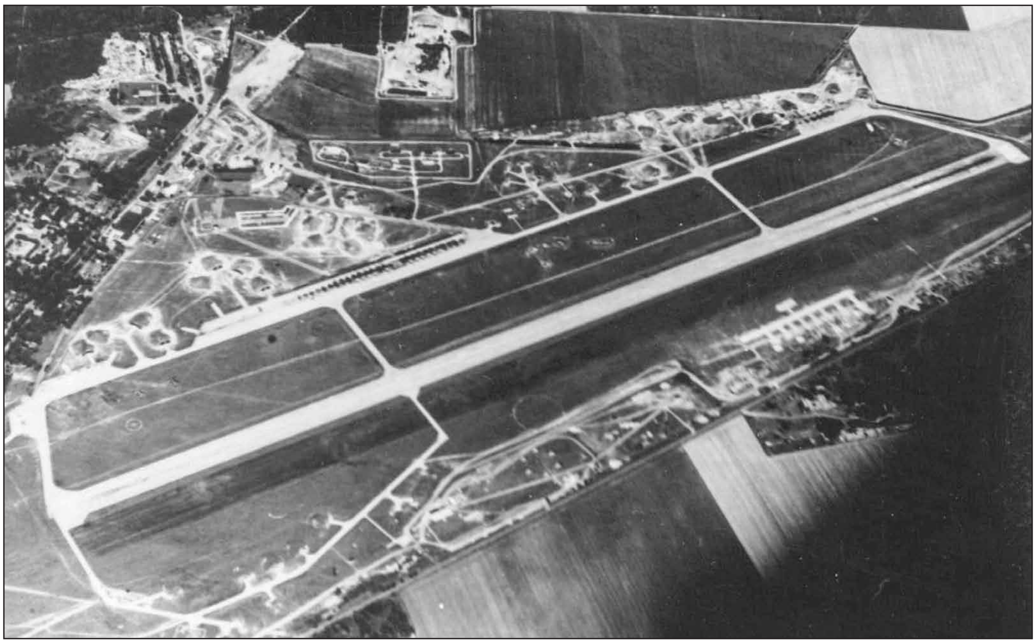
Even so, the West struggled to find many confirmed locations for Soviet nuclear weapon storage in the GDR up to the early 1970s. However, aircraft were sometimes seen making simulated loft bomb style, nuclear deliveries at selected air weapons ranges covered by Liaison Mission tours. The defection of young Soviet pilot, Lieutenant Yevgeni Lvoitch, who flew his SU-7BM 'Fitter A' across the IGB and ejected close to Braunschweig, on 27 May 1973, changed all that. He provided a whole catalogue of new intelligence on Soviet nuclear dispositions in the GDR. Zerbst was one of those 'nuclear bases'.

Between 1972 and1975, the 35 IAP maintained 12 of its MiG-21MTs in the nuclear role. Later developments were described by Soviet 'Technical Officer' Boris Rytschilo, who served at one time with the resident 35 IAP (Fighter Regiment). He explained that the nuclear-capable MiG-23M (Flogger B) was introduced to three air bases in the GDR. The 31 GvIAP at Falkenberg in 1973, the 35 IAP at Zerbst in 1975 and the 787 IAP at Finow. The 85 GvIAP at Merseburg followed in 1976, all part of the Soviet 16th Air Army. At the time, the Flogger B was the most modern and sophisticated aircraft in GSFG. However, even by 1980, the Flogger Bs were already considered obsolete, with the more advanced MiG-23ML Flogger G being delivered to other Fighter Regiments. Zerbst was also the HQ of the 126 Fighter Aviation Division.

Boris Rytschilo has described:

> The training of air-to-ground missions increased in frequency. During darkness (to avoid enemy detection) the 2nd Squadron practised the attachment of special bombs (meaning nuclear) to the aircraft, hoping to avoid the 7405th's C-130s.[2]
>
> In about 1982, our Regiment was transformed into a Fighter-Bomber Regiment (the 35 APIB). It remained active as a fighter-bomber unit until 1989 when its obsolete MiG-23Ms were swapped for MiG-29 Fulcrums and it again became a fighter unit.

The 35 IAP's conversion to the MiG-29 was itself unusual with the aircraft being transferred as a whole from the 53 GvIAP at Siauliai, in the Lithuanian SSR as it converted to the MiG-27 using aircraft drawn from other units.[3] The 35IAP were withdrawn from Zerbst in June 1992.



Zerbst airfield, under the Southern Corridor was probably overflown more than almost any other. Here, photographed by Sam Baker with a hand-held camera. (Sam Baker)

for Soviet and East German missile and radar activity. Transmissions were recorded for later exploitation and the operators were always alert for any newly deployed radar or missile systems. The rear crew could communicate with US listening stations monitoring US and opposition air activities.

Robert said that the SEO was instructed by the forward navigator to move the 'Big Item' camera to the appropriate side of the aircraft simply by calling 'camera right' or 'camera left' as the aircraft ran in towards its next target. The vertical panoramic camera was operated to meet the target plan, but all crew members could call for it to be activated if they noticed any targets of opportunity as they worked along the Corridor.

John Stephenson continued:

> We tended to fly at the lowest level allowed in the Corridor, often where the clouds were forming, so it could get a bit bumpy. Sometimes we had to ask the pilot to climb 500ft or so, but not so much, perhaps up to a maximum of 5,000ft. One of the Aerial Observers' additional duties was to keep a watch out for the formation of rime ice which sometimes gathered on the front of the scanner's windows and the FLIR head. If they noticed any ice growing on the aircraft tail, they would tell the pilot to activate the de-icing.
>
> At the Berlin end of the Corridor, when we arrived in the Control Zone, we mostly flew a single orbit of the BCZ, cleaned up the aircraft (including the AO's doors) and landed at Tempelhof. The aircraft was always positioned with the crew entrance door facing the terminal building. As we parked up, the Observer on the right para door would jump out to choc the aircraft. If

Aerial Observer Staff Sergeant Bob Bregent had recollections of Zerbst's period with MiG-21s during his time flying C-97s on Corridor missions between 1968 to 1971.

> We were very rarely intercepted in the Corridor but Zerbst was a huge Russian airbase and sometimes they sent up their MiG-21s. God they were beautiful aircraft. Shiny like they were brand new and with a big red star on the tail. The MiG pilot would give us a thumbs down, waggle his wings and put the landing gear down which was of course ignored, but it was a wonderful sight.

Sam Baker recalled that on two occasions during his time flying home from Berlin:

> We observed a Soviet MiG-21 lift off from Zerbst and head westbound. It approached from behind and was accelerating rapidly. He passed safely under our left wing while executing a series of snap aileron rolls. Having pulled ahead of us, he then executed a sharp pitch up to climb in front of us as he passed through the Corridor's airspace. Clearly intentional in both cases and certainly not a standard Zerbst departure. Done for show to impress us and accepted as such.

At least some of the 35th IAP's Zerbst based MiG-23 'Flogger Bs' had a nuclear role from the early 1980s up to 1989. (B Rychilo)

In 1989, the 35th IAP swapped its fighter-bomber MiG-23s for MiG-29 'Fulcrums' transferred from the Lithuanian SSR as it became a fighter unit again. (Eric Bannwarth)

> anyone was looking in from that side, it would appear to be a normal 'trash hauler' C-130. Even with a long lens, they could only see what looked like a bit of palletised cargo. However, by the left-hand door were non-standard boxes for the storage of the removable window bubbles.
>
> Once the aircraft equipment was secured, we could get off. The three onboard 'boxes' that housed the 'Big Item', FLIR enclosure and electronic suite would be padlocked. Once all off the aircraft, the loadmaster or flight engineer would alarm the aircraft and padlock it and we went to lunch.

During that time, one of the Airborne Observers called the then 690th Electronic Security Group at Tempelhof. The FLIR scribe wrote a brief intelligence report that would be passed back to base via a secure line from a ground floor office at Tempelhof close to the flight line office. He also checked for any updates that might make it necessary to change the return leg of their flight plan.

> For departure, we all boarded the aircraft, began opening up our equipment and took off again, did an orbit of the BCZ and headed off down our return Corridor. Once we landed back at Rhein-Main again, we gathered the film from the SEOs and all the cameras and drove it back to Wiesbaden AS where our photo-processing cell was located. That could be 1700-1800hrs, they would process the film and the IPIR team would drive over from Schierstien to pick it up and the whole process would start again.

John's Corridor flying period ended in May 1989, after which he went as the NCOIC to head the IPIR team.

Catching new items of Soviet equipment or unusual deployments, was always a highlight for crews. John recalled that at the Soviet-occupied Zerbst Air Base, underneath the Southern Corridor, flights had noticed some unusual mound constructions adjacent and parallel to the end of the runways. He continued:

> Then we got word to say the Soviets were going to start deploying MiG-29 Fulcrums there, so we thought perhaps the mounds were something to do with that. On one mission we were just coming out along the Southern Corridor when we got a tip to say there were a flight of Fulcrums arriving in East Germany. As we approached Zerbst, we hoped they would appear. I feel sure they must have known that and held off until we passed the airfield. As we turned the FLIR backwards we could see the Fulcrums arriving. So, the next day, coverage of Zerbst was the top priority, just to check they were there.

John Stephenson described one 'scoop' in the mid-1980s:

> We had heard rumours that SA-11 and SA-12 SAMs were soon to arrive in the forward area. On one flight along the Central Corridor, I was looking at some of my pet targets to the north around Stendal and Gardelagen. I said that I thought I could see some 'stuff' and asked the FLIR operator, who was looking south if he could swing around, but he was busy looking at Colbitz. I had the navigator start imaging with the oblique to the north and when we got back, the film was unloaded and sent for processing and exploitation. When we came in the next day someone told us that we had caught a Box Spring B surveillance radar associated with the SA-12.
>
> Over the next few weeks, we kept re-photographing it as it looked like it was trailer mounted. We finally worked out that it was mounted on a Zil truck. The radar would be prepared by sliding the cover, which housed the folded radar, forward over the truck cab which had made it look as if it was separately mounted on a trailer. Then the antenna was unfurled. The great thing about this imagery was that it was in 3D, so we used it in the training section at the 497th, which ran the Advanced Imagery Interpretation Course, to make some line drawings from the imagery for circulation around the intelligence community.

Soldiers with the Air Force

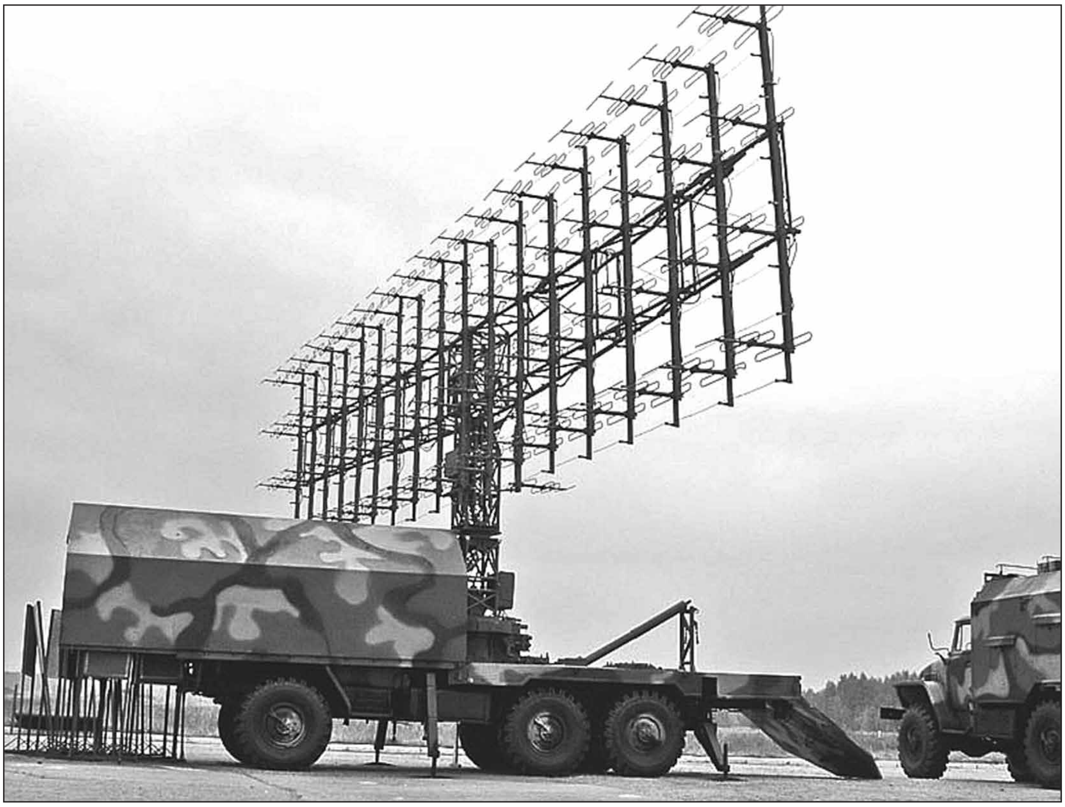
Whilst USAF personnel and equipment provided the Lion's share of the people and equipment, the US Army also had a great interest in the Corridor missions. They provided a small number of AOs for Corridor flights and embedded within the 497th RTG at Schierstein.

Don Willey was a US Army Image Analyst who did two tours working the Berlin Corridors, the first from June 1981. When he arrived in West Germany he was assigned to work with the 497th RTG.

> When I first got there, I was told I would be working on elements of the Group of Soviet Forces Germany covering the Third Shock Army and part of the 16th Air Army. But as soon as I found out what Aerial Observers did, I wanted their job. First, you had to work as a standard Photo Interpreter, then you were required to work on the 'Creek Misty' IPIRs and that way you learned just about everything. There were some pretty sharp guys there and you had to know your stuff. I became an AO in June 1982.
>
> We were completely integrated into the Air Force team; it was an outstanding assignment for a soldier. For my first tour, the Army, organisationally, sort of didn't know where you were and as long as you turned up every day and did your job, the Air Force was happy, so we had considerable freedom. That had changed by the time of my second spell in Germany. The first time around, our Detachment was assigned to a unit nominally in Washington DC. By 1987 we had become part of the 66th Military Intelligence Brigade Headquartered in Munich, so we had a lot more people interested in us and who wanted us to do standard Army training as well.

Don explained the mission planning process from his point of view as an Army Aerial Observer:

> Our day started with going to the 497th at Schierstein where the four AOs scheduled to fly, did a quick review of what had happened in the previous few days, noted anything of special interest and reviewed recent message traffic. Then we drove over to Rhein-Main to join the rest of the team. We discussed the targets we wanted to cover, especially if there was something of particular importance to



It took time for analysts to realise that a newly discovered model of the NATO codenamed 'Box Spring' radar was mounted on a Ural 4320 flatbed truck behind the cab. The aerial cover was moved forward to allow the radar to be unfurled, rather than being towed by a separate trailer. (US Army) us going on. If not, there was the necessary routine coverage to complete.

The ELINT guys from Rhein-Main had their input too. If they had something special going on, they would ask to cover those locations. After that, we had about an hour of downtime before we went out to the plane. Then it was just off to Berlin, pretty much as simple as that for us. When we landed at Tempelhof we would file a short interim ‘highlight’ report detailing any observations of particular note.

As we approached the entrance to the Corridor, we were 10,000ft with the aircraft un-pressurised. At that stage, we replaced the standard looking side paratroop door windows with our special observation blister panels. Removable panels were inset into each of the aft doors on each side of the aircraft. The panels were unclipped, flipped down and removed. Then we pulled out the blisters, each with two little notches on the bottom and they were slotted back into place on the door as we pushed the panel back up into place and fixed it into the top of the frame to secure it. We then assembled the small chair provided and looked out of the blister windows, using our binoculars when necessary.

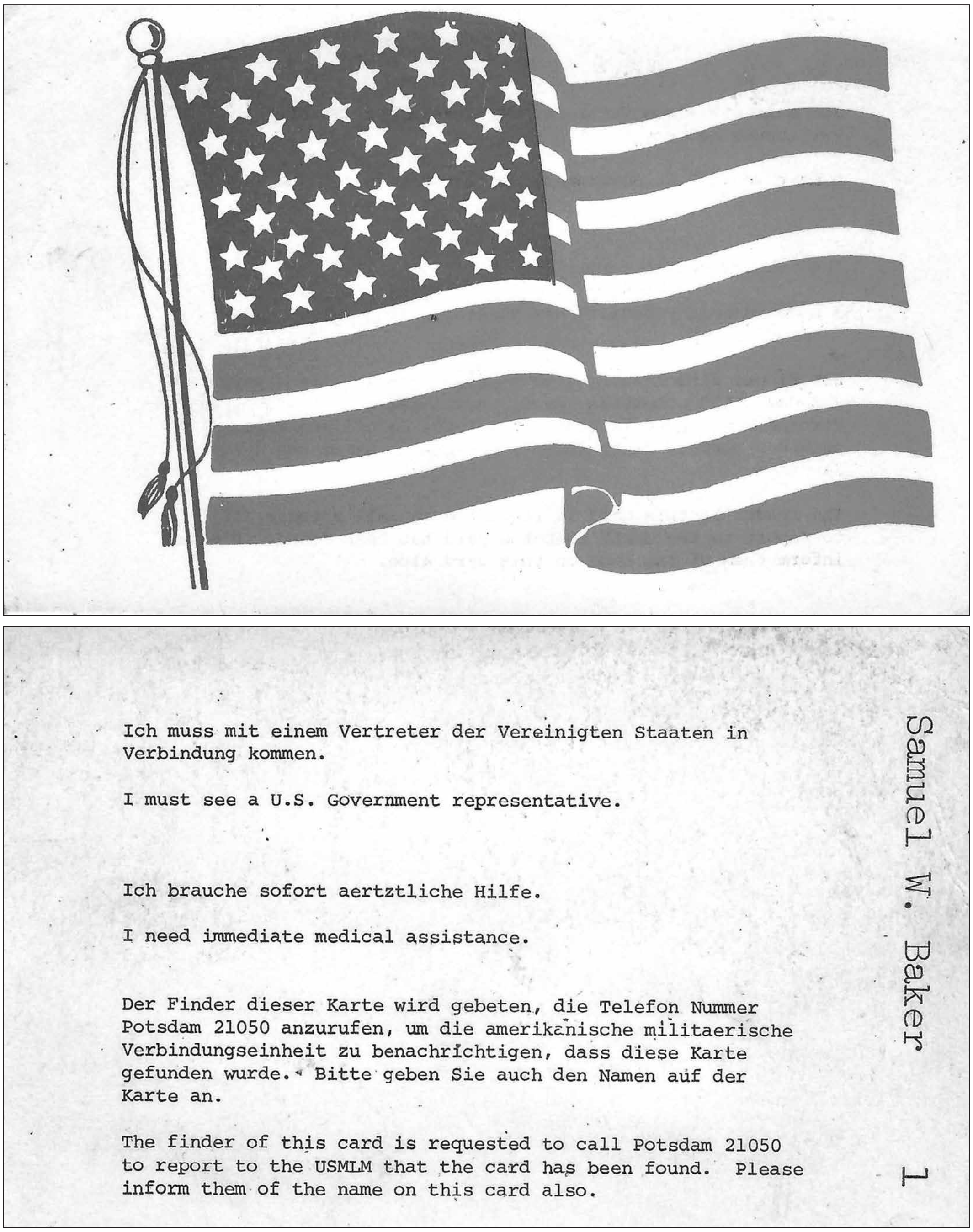
The blisters were great but were not good for taking photographs from hand-held cameras because of the distortions they gave. They were deep enough that you could put your head ‘into’ them and look properly outside the plane, down and under it. As we progressed down the Corridors if the two guys in the blisters saw anything of interest, they could hit the intercom button and call ‘Pan-on’ and the panoramic camera operator activated it.

Of the two guys in the FLIR box, one operated the camera and the other noted down the targets as we went down the Corridor. We could open and retract the FLIR as required with the push of a button. It was linked to a video recorder and its head moved with a simple computer joystick. We sometimes flew at night, so we could use the FLIR, I think we were required to fly at least one night mission a month.

On occasions, we flew ‘Quick Turn’ missions either on a pre-planned basis or because during a flight we saw something of special interest and wanted to go back. When we landed back at Rhein-Main from the first mission, someone would meet us at the plane and was given all the first mission’s films. We then simply turned around and went right back to Berlin. We pre-planned these flights periodically I guess just to throw the Soviets off a bit.

There is plenty of anecdotal evidence to indicate that the Soviets and East Germans were well aware that normally, once one of the Allied ‘spy aircraft’ had flown over them, they were unlikely to be revisited that day and so could carry on and not be seen anymore.

We just tried to catch them out occasionally. We often varied our flight times every day, but it was not hard for them to figure out we would come over sometime in the morning, so they just had to



Ich muss mit einem Vertreter der Vereinigten Staaten in Verbindung kommen.

I must see a U.S. Government representative.

Ich brauche sofort aertztliche Hilfe.

I need immediate medical assistance.

Der Finder dieser Karte wird gebeten, die Telefon Nummer Potsdam 21050 anzurufen, um die amerikanische militaerische Verbindungseinheit zu benachrichtigen, dass diese Karte gefunden wurde. Bitte geben Sie auch den Namen auf der Karte an.

The finder of this card is requested to call Potsdam 21050 to report to the USMLM that the card has been found. Please inform them of the name on this card also.

Samuel W. Baker

1

On Corridor and BCZ flights, crews carried their US military ID cards, removed unit patches and personal items. In case of a forced landing in East Germany, they carried this special card that asked the finder to notify the US Potsdam Mission House. It went with another that contained an East German 50 Pfennig coin for the call. (Sam Baker)

> wait until we had gone. During my first tour, we flew pretty much every weekday and occasionally the odd weekend mission too.
>
> My very first Corridor was a nighttime 'Quick Turn' flight. Having returned to Rhein-Main, we soon got airborne again and went along the Central Corridor to overfly the huge Letzlinger Heide training area during a Soviet air defence exercise. As we passed the area, we saw all this anti-aircraft tracer fire arching upwards off to one side of the Corridor. Whilst it was no threat to us, it was close enough, kind of amazing and sobering to watch.

Like many others involved in Corridor flights, one of Don's most memorable flights involved Werneuchen airfield. As he explained:

> We arrived there on the day a nuclear weapon transhipment was passing through. We caught them by surprise and saw a large transport on the tarmac. A MiG-25 Foxbat took off and played a bit of chicken with us. He made several very close passes at us, which were close enough that the BARTCC radar folks thought there was a mid-air collision. It became a little too dangerous, so our pilot sensibly decided it was time to leave the area.
>
> During my first tour, there was a very rigorous escape and evasion training, in case we had to force-land in the East. They showed us ways we could meet up with the Western Military Liaison Missions in such situations. By my second tour, things had become much more relaxed as international tension had eased a lot. We were told just to go and stand in the middle of the road and wait for anyone to come along.
>
> In case we managed to escape from a crashing aircraft in the Corridors by parachuting out of it, we carried some special cards with us. On one side they had a US flag and we put our name and social security number on it. On the other side, there were English and German phrases that asked the finder to contact a special phone number. That way, our side hoped to know that at least we had at least escaped from the aircraft.

Don mentioned his contact with the Lark Spur team at Tempelhof:

> We talked with the Lark Spur people at times and I even got to fly a mission with them in a Pilatus UV-20A. That was pretty amazing because we were flying so low. There were two pilots upfront with a bench behind them that ran down the side of the aircraft on which we sat sideways. They opened up the side door of the aircraft and we leaned out with the camera and shot away taking pictures. On the mission I went along with, as we passed over one Soviet installation, an old disused airfield, that housed a signals battalion, they shot flares at us to get us to go away.

He also compared the differences between his first and his second tour:

> In the early 1980s, as individuals, we flew around three times a week. During my second tour, I had become NCOIC for the USST, which was normally a non-flying job, but HQ agreed that I could still fly once or twice a week. From our point of view, you could tell that things were changing, not in a worrying way, but there was a general decline in all Soviet exercise activity and their troops rarely left barracks in large numbers anymore. What had been just a few years before, huge multi-division exercises, often ending up in the Letzlinger Heide area, where we watched as whole units forded the rivers on their way there, became much smaller battalion and company-sized activities. All the big stuff was over. We carried on flying as normal after the fall of the Wall. I was lucky enough to be on the very last mission that we flew on 29 September 1990. Don stayed at Wiesbaden involved in closing down the 497th RTG as Schierstein until on 1 July 1991 the Group moved to RAF Molesworth in the UK, being established as part of US European Command's Joint Analysis Centre.

In addition to the US Army contribution to USAF Corridor flights, it had a separate, smaller-scale operation at work over the BCZ using light aircraft, later codenamed Lark Spur.

6

FLYING SOLDIERS IN BERLIN

The US Army's Berlin Aviation Detachment was a small but key element, of its military presence in the City during the Cold War. Flying low, its fixed-wing aircraft and helicopters fulfilled several overt and classified tasks. In the cautious, euphemistic, language of the Cold War, Lieutenant Colonel Douglas Powell, the Berlin Aviation Detachments commander in 1990, explained the unit's main tasks in *Soldiers* magazine, just a few months after the fall of the Berlin Wall:

> First, we provide priority air transportation for American, British and French military personnel, as well as for American and West German government officials. Second, we conduct special air missions as directed by the Deputy Chief of Staff for Intelligence. And third, we provide tactical training support for the Berlin Brigade's three infantry and combat support battalions.[1]

That second point in the description was a discreet reference to the tasks performed by operation 'Lark Spur' which collected intelligence from low-level flights over the BCZ for many years. The BCZ's 40-mile diameter permitted considerable freedom of movement and allowed the Americans, British and French to overfly East German territory in the Zone. This included the many Soviet military bases well beyond the confines of West Berlin and made it an invaluable part of Allied intelligence collection.

Early Years

Based at Berlin's stunning pre-war Tempelhof Central Airport, what became the Berlin Aviation Detachment began in 1951 equipped with three Hiller OH-23 Raven helicopters. Their missions supported United States Command Berlin (USCOB) activities, flying patrols around West Berlin. Although they could have legitimately flown throughout the whole BCZ, the Detachments helicopters confined themselves to the City's Western Sectors, probably because of their fragility.

By 1958 Bell OH-13 Sioux had replaced the OH-23s which left in 1962. Between 1962 and 1964 the unit had a short spell with the H-34 Choctaw until it too, was exchanged for the ubiquitous UH-1B and later UH-1H that became the mainstay of the unit. In 1962, it was renamed the 'US Berlin Brigade Aviation Detachment'.

During that second Berlin crisis, there were numerous Soviet complaints about US helicopter flights. One protest from the Chief Soviet Controller detailed:

> Today July 19, 1962, an American helicopter No. 640 which took off from Tempelhof airport at 0824Z, irrespective of the fact that the region of its flight was limited to West Berlin, flew over democratic Berlin and from the open door of the helicopter pictures of different objects of the GDR were taken.[2]

American responses to similar protests reasserted the West's 'freedom of movement' within the BCZ and their intention to continue exercising it, whilst the photo-taking was simply ignored.

The *Stars and Stripes* in August 1968 reflected on life in the Aviation Detachment; the Detachment was flying six UH-1Bs, one Cessna O-1 (L-19) Bird Dog and one Beech U-8D Seminole 'command plane' from Tempelhof AB. It comprised eight officers and 14 enlisted men who flew around 1,200 flying hours a year. Unless bad weather conditions prevented flying, the Detachment flew at least one mission per day and once or twice a week, a longer flight covering the city's Western sector borders in detail. A patrol crew consisted of a pilot, co-pilot and crew chief.[3]

Vietnam-Era Operations

New Yorker, Rich Demoro was a UH-1B crew chief with the Detachment in September 1968 following a combat tour in Vietnam. As he described:

> I was used to big cities, so I felt right at home in Berlin. West Berliners treated us much better than many Americans did at home. At home, there were lots of anti-war protests which made life very uncomfortable if you were a GI at the time. The people in Berlin were great. In Vietnam, we had lived in a tent in the middle of nowhere so sending me to live at Tempelhof, a civilian airport was just wonderful. It just had to be the best Army duty in the world.
>
> We were equipped with four UH-1Bs, a U-6, a Cessna Bird Dog and a Beech U-8D Seminole 'command plane' mostly for moving senior people in and out of the City. As a helicopter crew chief, wherever 'my' helicopter went, I went too. We had 30 officers and 12 enlisted men in the unit at the time. Most had recently completed Vietnam tours and Berlin seemed to be a sort of 'way station' to give the pilots a year R and R before they returned to Vietnam.
>
> Each day we flew, I was responsible for getting my UH-1B [63-551] out of the hangar, taking its covers off, doing a fuel check and making sure it was configured properly for the flight. We often checked the Wall construction work that was still going on then. Berlin was like being in a big fishbowl. We took off and kept flying left-hand turns around the Western part of the City until we eventually ended back at Tempelhof. In the air, Crew Chiefs kept an eye out for other aircraft and supervised the loading and unloading of passengers and cargo.[4]

Another important BAD task was to re-supply the US Army Military Police who guarded the tiny Steinstücken enclave. The helicopters had to land on a small plot surrounded by East German territory and this led to occasional exchanges of 'repartee' with the Vopos (East German Police). CWO Eugene Kollar recalls that: 'the Commies are so close they practically breathe down our neck'. One day he called 'Good morning' to them and a VoPo replied in perfect English: 'It isn't a very good morning in Vietnam'.[5]

> Once in a while, we would land at one of the Berlin Barracks to pick up a military intelligence 'Spook' and take him to look at something specific.[For those reconnaissance flights, an observer from Brigade G2 (Intelligence) would be picked up at Andrews Barracks.] But generally, we just keep our eyes open, trying to observe any changes to the border fortifications.

14855
UNITED STATES ARMY
BERLIN

The Cessna O-1 (L-19) Bird Dog was an ideal light aircraft for US Army observation work over the BCZ being small, quiet and highly manoeuvrable. Photographed at the 1966 Tempelhof Open Day. (Ralf Manteufel)

PAN AMERICAN
U.S.ARMY
76036

Seen at the end of Tempelhof's runway, the U-8D was used by the US Army Berlin Air Detachment as a communications aircraft and not believed to have been involved in reconnaissance operations. (Ralf Manteufel)

0-17305
FREEDOM CITY
UNITED STATES ARMY

Berlin Aviation Detachment UH-1H photographed at Berlin-Tegel in April 1993. From the early 1960s, these helicopters were the mainstay of rotary wing operations from Tempelhof. (Philippe Ferretti)

Besides the patrols, the Detachment undertook troop lifts to support exercises and give border orientation flights to visitors, including French and British officials.

> We had a special chopper for VIP tours around the City, mainly for senior officers and political visitors. It had comfy plush seats; in all the others we had the normal canvas seats. It was highly polished and even had a heater in it, which meant in the winter you could keep warm. Most of our UH-1Bs were well-worn, a bit tired and painted the more usual US Army olive drab. We did our own 'VIP tours' for less senior officers who had perhaps just moved to the City and needed some orientation. It was a more relaxed time, we also flew around civilians; I remember on occasions flying some BEA airline crews around who were visiting the City. At times it felt like we were more like a taxi service, but it was great duty.
>
> We flew around often without great attention to our altitudes mainly flying no higher than 400ft. We flew the Berlin police around when there were big protests so they could monitor the situation. More enjoyable were other missions where we flew tag with the Brits and their helicopters which were very manoeuvrable and could turn inside us. At the time, air assault was in its infancy, but we did a lot of work with US and British troops, teaching them some of the early tactics. Tempelhof was great to operate from as long as you kept your wits about you.

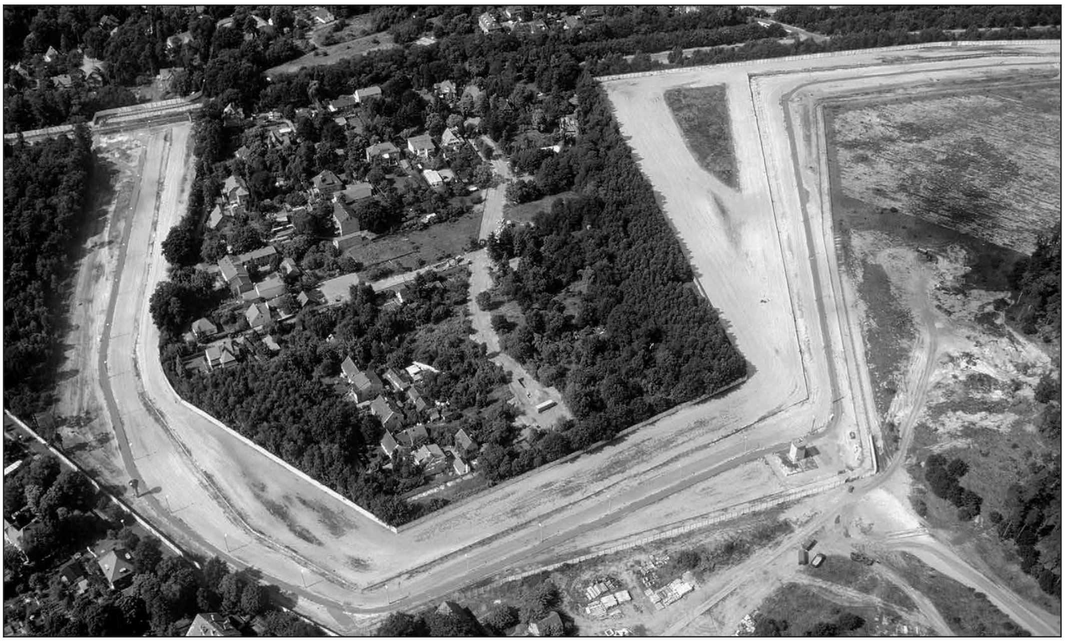
A newly arrived pilot's priority was to become mission qualified on the UH-1, which usually took six to nine months. As well as being expected to operate effectively in the busy and heavily restricted Berlin airspace using 'Freedom City' call signs, pilots had to learn a detailed brief on Berlin and its history for the benefit of VIP passengers during 'historical overflights' of the city.

The Detachment's workload was heavy as its 1969 statistics show. It flew 1,619 hours on 1,458 missions with 4,761 takeoffs and landings carrying 4,675 passengers and a total of 56,435lbs of cargo. Rich Demero left Berlin in September 1969 and as he observed:

> My chopper crashed into a German farmer's apple orchard, right outside of Tempelhof about two weeks after I left the Detachment. No one was seriously injured, but the helicopter was not worth repairing locally. The loss broke the Detachment's 16 years, 362-day accident-free record during which it had flown 25,477 flight hours. These B models were getting tired, really designed as gunships. The later, more powerful models with more space inside were far better suited as troop transports.[6]

In the event of war, West Berlin would almost certainly have been rapidly overrun. However, the Detachment regularly rehearsed its wartime role. By 1981, during any conflict, the Detachment was expected to provide an air assault capability and move mobile anti-tank teams around the City. Keeping the aircraft safe from attack would have been vital. In one edition of the *US Army Aviation Digest*, it described how the Detachment regularly sought suitable urban sites, like industrial facilities and garages, where the UH-1s could be concealed. The streets outside also needed to be sufficiently wide to support STOL aircraft operations. Suitable nearby buildings would have been used to provide makeshift maintenance hangars and Command Posts, with some petrol stations identified for pre-positioning of aviation fuel. Nearby tall buildings would have provided further concealment for movement in and out of the sites.[7]

One secret task that was only revealed in James Stejskal's 2017 book *Special Forces Berlin*, was the Aviation Detachments' support for the US Army's unconventional warfare (special forces) unit based in the City. Known by various names including 'Detachment A' and 'Physical Security Support Element Berlin', it regularly worked with the Aviation Detachment. Sometimes, this involved using the UH-1s and the U-6 to fly around the edge of the Western zone to search for



Otherwise isolated, a small road connected the Steinstücken enclave to West Berlin but US Army helicopters kept the US Military Police Detachment guarding it supplied. (USAF/ Chief Master Sergeant Don Sutherland)

Just visible, UH-1B 63-551 made its last flight with the Berlin Aviation Detachment in autumn 1969 when it lost power not far from Tempelhof airfield and force-landed near an apple orchard. The airframe was subsequently scrapped. (via Rich Demero)

0-15595
UNITED STATES ARMY
FREEDOM CITY

Using 'Freedom City' callsigns, US Army Berlin Aviation Detachment UH-1Hs were a regular sight over West Berlin. In this shot, a UH-1H prepares for a ceremonial flypast over the City to mark their departure in June 1994. (US Army)

possible troop insertion points into the East. In late 1977, they worked to help train helicopter rappelling skills to the Berlin City *Sondereinnsatzkommando* (Police Special Operations Command). The Aviation Detachment also used its UH-1s to practice assault landings with Detachment A's troops onboard at the 'Doughboy City' training area in their preparations for the abortive April 1980 Iranian hostage rescue operation.[8]

US Army Fixed-wing in Berlin

As well as helicopters, the Berlin Aviation Detachment also flew several fixed-wing aircraft in communications and reconnaissance roles. These included a Cessna O-1 Bird Dog that was succeeded by the Cessna O-2 that itself left in 1979. The long-serving De Havilland Canada U-6A Beaver which had first arrived in Berlin in 1958, also left in 1979. The twin-engined Beechcraft U-8 Seminole of the 1960s was succeeded by a Beech U-21 and then, a C-12 from 1986 to 1991. These tended to be used as shuttles and VIP transports between Berlin and West Germany. Two Pilatus UV-20 Turbo-Porters joined the Detachment in 1980 and remained until the end of US Army operations in 1991, mainly engaged in reconnaissance operations.

Harold Smith served with the Aviation Detachment from December 1969 to August 1970. He explained, 'Helicopters were more limited for carrying out photography in poor light because their vibration required higher shutter speeds. Thus, single-engined light aircraft did the serious photo work'. He described that typically only three pilots in the Detachment were qualified to fly the light aircraft at that time.

On my first flight, the pilots were discussing whether to fly

A major task for the US Army UH-1s in West Berlin was to transport VIPs. Here, US Defence Secretary Caspar Weinberger lands at an open site near the Berlin Wall in May 1985. (US Army via *Alliierten* Museum)

> clockwise or counterclockwise. I asked why it mattered and was informed that the Soviets or East Germans would turn on their missile radars as we flew over. They liked to change directions now and then to keep the radar operators on their toes and wondering what our deep motive was for choosing a particular direction.

As they went out to their aircraft, one of the Detachment sergeants would call the local SIGINT team to warn them of their imminent departure.[9]

Project Lark Spur

The freedom of air movement within the BCZ, gave Western Allied forces considerable opportunities for collecting intelligence on Soviet and East German activities. The British, French and Americans all had different arrangements for light aircraft operations over the BCZ. The US effort became codenamed 'Lark Spur', authorised in 1967 to photograph Soviet and East German installations in the BCZ using fixed-wing aircraft of the US Berlin Brigade Aviation Detachment.[10]

Even by the mid-1970s, there was little coordination with the British and French in these light aircraft missions over the BCZ, probably because 'Lark Spur' was managed by US Command Berlin rather than the USMLM. The similar British and French operations were much more closely integrated into their respective MLM's activities.

In 1974, Colonel Peter Thorsen, then recently assigned as USMLM Chief, convinced his superiors that USMLM officers should participate as observers in 'Lark Spur'. Researcher Hugo Mambour gained a detailed insight on some of the operations by interviewing former USMLM participants Nicholas Troyan and Thomas Spencer.[11] Captain Troyan was involved from the very start of USMLM participation in 'Lark Spur', one of two officers initially

A Cessna O-2 was used for BCZ flights for a few years in the mid-1960s until 1971. (Ralf Manteufel) assigned to those duties. He said he was 'thrilled at having the opportunity to be an observer for Lark Spur'.

Their BCZ missions were scheduled for every third day, weather permitting. During flights, crews carried no flight suit insignia or documents, other than their military identification cards, in case they had to force-land in East Germany. He explained that he flew with Sergeant First Class (SFC) St John, from the Berlin Brigade who was regarded as the real expert having flown missions over a long period. Troyan explained:

> Sitting in the co-pilot seat of the [U-6] aircraft, I noticed that it was very difficult to observe, let alone achieve a clear photo, through the front triangular window of the aircraft. SFC St John sat in the rear, and had a larger window; however, it also limited his ability to take very clear shots. In my 'youthful exuberance', I asked the pilot to remove the right door from the aircraft. After finding out that the 'Sovs' did not have, or did not use, height finding radar against our programme, I had the pilot fly lower than the 1,000ft AGL required. This, plus the opening with the door removed, allowed both the person in the co-pilot seat and rear-seat occupant to get much clearer shots of activities on the ground.

Troyan described what became one legendary U-6 Beaver flight. The aircraft was piloted by an Army CWO, with Troyan, who had gained a private pilot's licence, in the co-pilot seat.

> On one of our flights, as we approached the Dallgow-Döberitz barracks area, we saw what appeared to be an entire tank regiment that had just returned from manoeuvres and was lined up in front of the vehicle wash ramps.[12] SFC St John and I also noticed what appeared to be a new version of a BMP armoured personnel carrier. At that moment, I asked the pilot to let me take the 'control yoke'. I made a hard right bank, relinquished control back to the pilot, and began photographing the equipment around the wash ramp. At that time, I heard SFC St John tell me over the intercom that a lens he was changing on his camera had slipped from his hand during my hard banking of the aircraft, and he thought it had fallen on top of the 'Sovs'. He also said we should immediately head back to report this occurrence to HQ.
>
> I saw that most of the 'Sovs' around the wash ramps were pointing up at us, some with their AKs. However, this was not unusual, since any time we flew over their installations, they and the East Germans would point at us, some would wave, some shook their fists, and some pointed their weapons. [After that, the new Standard Operating Procedure became to ensure that all] lens swapping would be done inside the flight bag, which was to be secured to the aircraft seat.

The incident was unsurprisingly protested by the Soviets. The Chief of the USMLM was left to explain what a camera lens was doing dropping onto a Soviet base from a US aircraft. Doubtless the British and French commanders were somewhat quietly relieved that the incident had not (on this occasion) been caused by one of their aircraft. The event passed into the folklore of the three Allied missions and was retold many times.

Major Thomas Spencer explained how he became involved in the programme:

> In 1975, a Lark Spur observer position become available and I volunteered to extend my tour at USMLM for one year if I could be the USMLM Lark Spur programme officer. I had undergone pilot training earlier and I knew my two years of ground touring in East Germany had prepared me well for equipment identification, map reading, and the like.

When Spencer's request was approved, he became the first full-time USMLM Lark Spur Officer:

> Our aircraft were always outside the Tempelhof hangars so we carried our camera equipment in our aircraft helmet bags from the hangars to the aircraft and usually wore our helmets walking out to them. As a photography lover, it was a privilege to have photographic equipment that I could not afford privately. We used Nikon F camera bodies, with or without motor drives, 50mm, 135mm, 500mm, and 1000mm lenses, plus unlimited amounts of Kodak Tri-X black and white and Ektachrome colour film. Our onsite USMLM photo-processing laboratory completed the job and we could get the film developed within hours in a rush.

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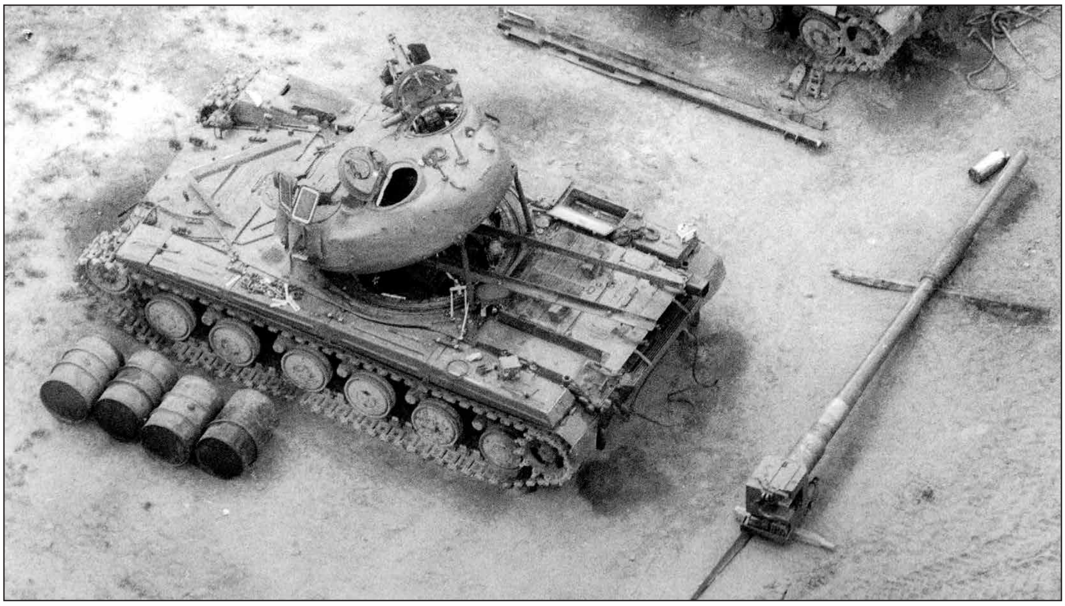
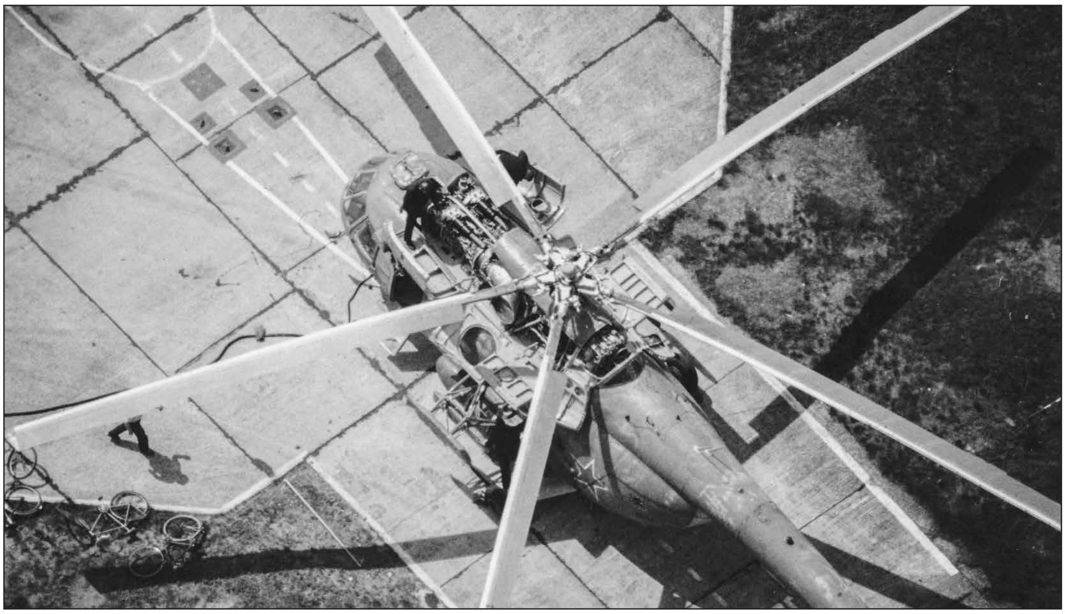
UNITED STATES ARMY

Photographed at a Berlin Open House, the U-6A Beaver was an ideal observation aircraft for use in the BCZ able to fly very slow, low and turn steeply. (Peter Seeman)



Catching Soviet tanks like this T–64 undergoing a main armament change, were the stuff of legend for BCZ flights. The barrel was removed and replaced through the back of the turret! (Crown Copyright via Medmenham Collection)



An Mi-8 'HIP' undergoing maintenance with all the servicing panels open. Shots like this from light aircraft over the BCZ were of great assistance in understanding the details of new equipment. (Crown Copyright via Medmenham Collection)

USMLM's wide range of camera equipment, and especially our quick turnaround photographic laboratory, plus the experienced USMLM officers, may well have been the deciding factors for USCOB agreeing to our joint Lark Spur operations and reports. However, overall results were much better, more responsive, and we produced a very large number of Intelligence Information Reports (IIRs) that helped greatly in satisfying the American intelligence community's requirements.

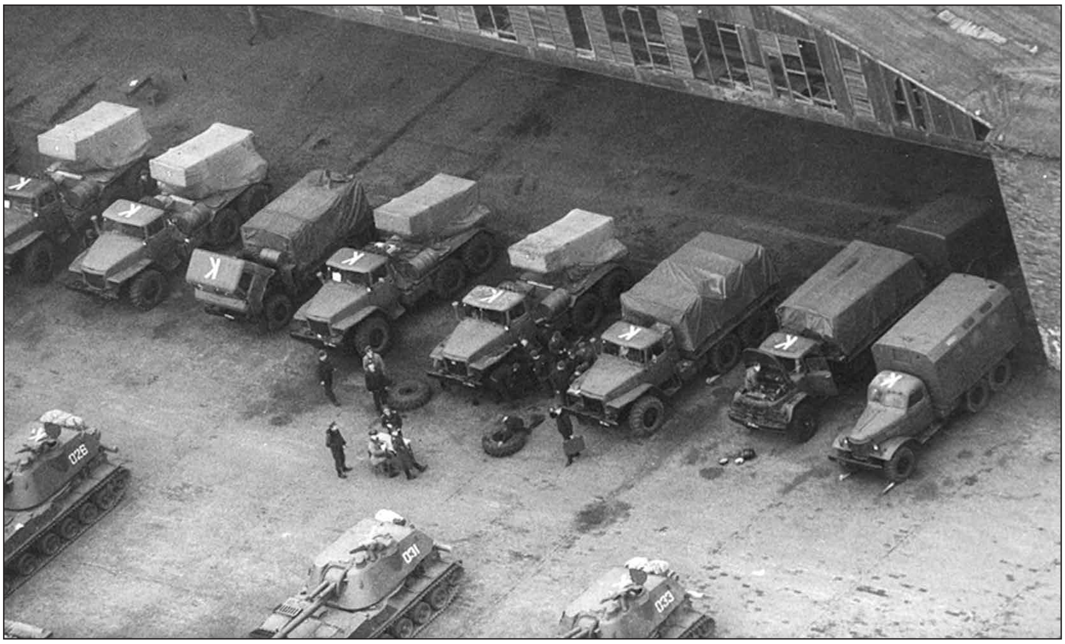
Typically, SFC St John and I sat in the back, each looking out one side for designated targets that had outstanding intelligence requirements from the myriad of intelligence agencies, plus always seeking targets of opportunity. Generally, the Soviets and East Germans paid little attention to us; however, if we did experience any signs of hostility, we took it as an indicator that we might be observing new equipment or something out of the ordinary. It usually just doubled our interest. On such occasions, if we had an adventurous pilot, we would ask for a 'wing over'. Aerodynamics being what they are, this manoeuvre resulted in the aircraft spiralling down in altitude and we would 'accidentally' slip below the 1,000ft AGL we were supposed to maintain.

Major Spencer explained the improved outcomes:

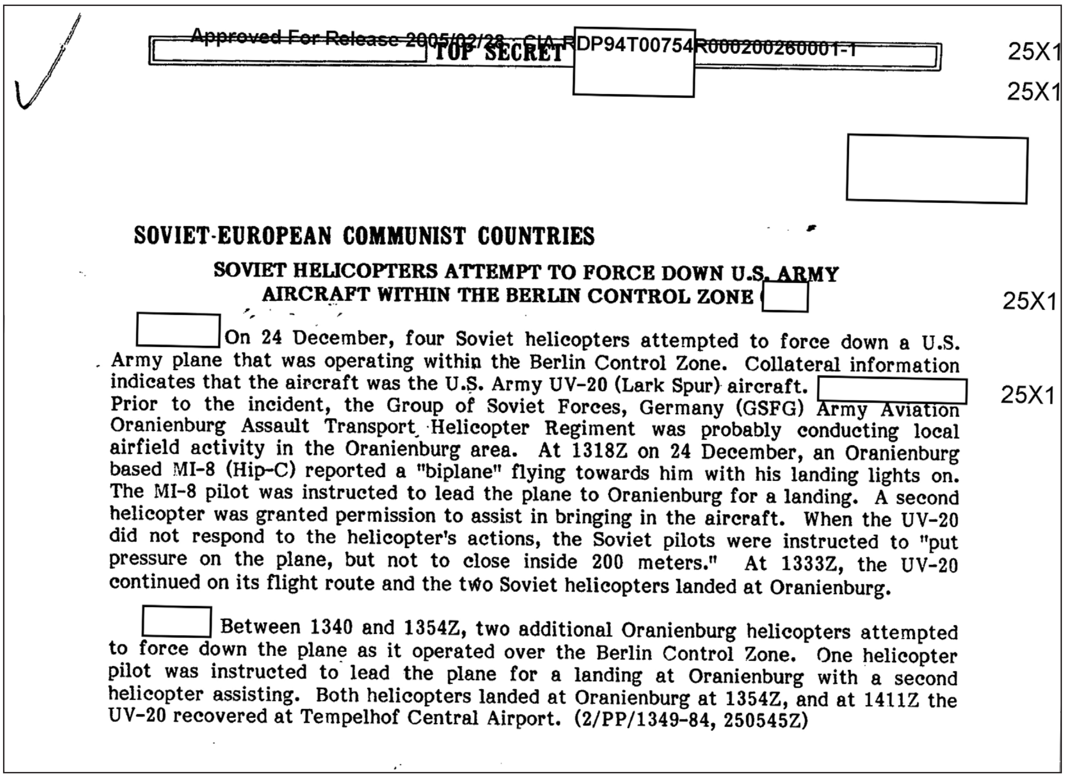
This resulted in much closer photos that were hand-focused at 1,000ft AGL (no automatic focus cameras were available in the 1970s). One had to concentrate, because the 500mm and 1000mm lens on the Nikon F motor-driven body could eat up the 36 frames of a Tri-X 35mm film in a very few seconds. By putting the wing over and circling a target, we were able to capture many pictures of the same subject, which could then be viewed by special optics that yielded three-dimensional views and provided intelligence analysts with more information. We even were able to look down into the interior of targets such as tanks, self-propelled artillery, and armoured personnel carriers.

The aircraft transponder, which sent our position and altitude to Berlin air traffic controllers, sometimes 'accidentally' failed to work on such occasions and the pilots would receive a radio call notifying them that they had lost contact with us. It was always interesting that the transponder would magically come to life again when we reached 1,000ft AGL. The full-frame, better-quality pictures sometimes resulted in questions from Colonel Thorsen as to how we were able to obtain such great pictures at 1,000ft AGL.

After flying missions in the 'ring' for several months, we were able to discern patterns of behaviour such as what days training took place and where, what days were wash days, maintenance days, inspection days, and so forth. Understanding these patterns helped guide us further in our collection efforts. Our observations also enabled us to provide subjective comments and personal analysis of activities, tactics, and training that a desk analyst could not do as well as someone who had had eyes on the target.



In spring 1981, a low flying French mission in the BCZ captured some BM-21 multi-barrel rocket launchers and other vehicles. The 'K' marking on the cabs was seen as an indicator of preparations for a possible intervention by Soviet forces in Poland. (MMFL Association)



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SOVIET-EUROPEAN COMMUNIST COUNTRIES

SOVIET HELICOPTERS ATTEMPT TO FORCE DOWN U.S. ARMY AIRCRAFT WITHIN THE BERLIN CONTROL ZONE [redacted] 25X1

[redacted] On 24 December, four Soviet helicopters attempted to force down a U.S. Army plane that was operating within the Berlin Control Zone. Collateral information indicates that the aircraft was the U.S. Army UV-20 (Lark Spur) aircraft. [redacted] 25X1 Prior to the incident, the Group of Soviet Forces, Germany (GSFG) Army Aviation Oranienburg Assault Transport Helicopter Regiment was probably conducting local airfield activity in the Oranienburg area. At 1318Z on 24 December, an Oranienburg based MI-8 (Hip-C) reported a "biplane" flying towards him with his landing lights on. The MI-8 pilot was instructed to lead the plane to Oranienburg for a landing. A second helicopter was granted permission to assist in bringing in the aircraft. When the UV-20 did not respond to the helicopter's actions, the Soviet pilots were instructed to "put pressure on the plane, but not to close inside 200 meters." At 1333Z, the UV-20 continued on its flight route and the two Soviet helicopters landed at Oranienburg.

[redacted] Between 1340 and 1354Z, two additional Oranienburg helicopters attempted to force down the plane as it operated over the Berlin Control Zone. One helicopter pilot was instructed to lead the plane for a landing at Oranienburg with a second helicopter assisting. Both helicopters landed at Oranienburg at 1354Z, and at 1411Z the UV-20 recovered at Tempelhof Central Airport. (2/PP/1349-84, 250545Z)

Details from a 25 December 1984 CIA report gives more detail on US Army Captain Tim Bloechl's mention of Soviet attempts to force a Lark Spur UV-20 to land at the ever sensitive, Soviet Oranienburg Airfield. (CIA: CREST)

Army Captain Tim Bloechl ran the programme from August 1984 to December 1986 as the Reconnaissance and Surveillance Officer for the Office of the Deputy Chief of Staff, Intelligence (ODCSI). He described flying in the UV-20A:

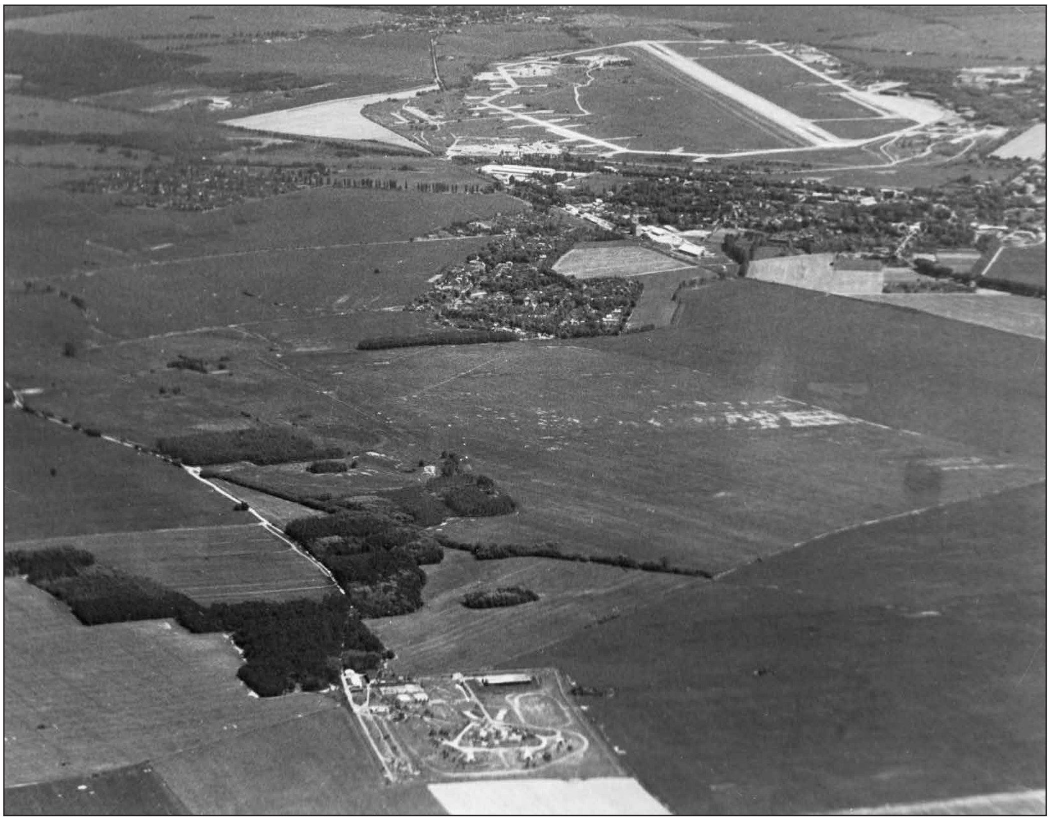
> The aerial view of Soviet and East German facilities also provided a perspective of the difference between these forces. Soviet garrisons were often untidy and poorly maintained. Indeed, when one flew over the aircraft hangars at Oranienburg, you could look through the holes in the roof to count the helicopters housed inside. Trash was everywhere.
>
> On the other hand, the East German barracks were very well maintained. One could sense a higher degree of discipline and morale within the East German forces. Periodically, USMLM officers would go on missions with us to check areas they were thinking about checking out the next day on the ground. On another occasion, in December of 1984 if I recall correctly, while in the vicinity of Oranienburg Airfield, three Soviet helicopters tried to interfere with our flight and it appeared to the pilot and crew members, this was an attempt to force the plane down. So, the plane left the area for a time, but when the crew felt the coast was clear, went right back to the airfield to see what they might be hiding. Our higher HQs were not very happy that they did so!
>
> Otherwise, we largely conducted each mission without incident. Our biggest challenge was usually the weather. Low cloud ceilings and reduced visibility, particularly in the winter months, caused many mission cancellations. Also, during the winter, it got awfully cold with the side door open on the plane![13]

The Venerable U-6 was replaced by two Swiss-built, Pilatus UV-20A (Turbo Porter) 'Chiricahuas' which had arrived in 1980 and remained until the Detachment's deactivation. The aircraft received some special modifications that included the replacement of the two windows on the right side sliding door with a single, large, optically flat rectangular window to facilitate photography, although the aircraft frequently flew with the door open. In addition, the right side exhaust nozzle of the Pratt & Whitney PT6A turboprop was extended downwards to deflect the hot exhaust gases clear of the windows that could otherwise have blurred any pictures taken.

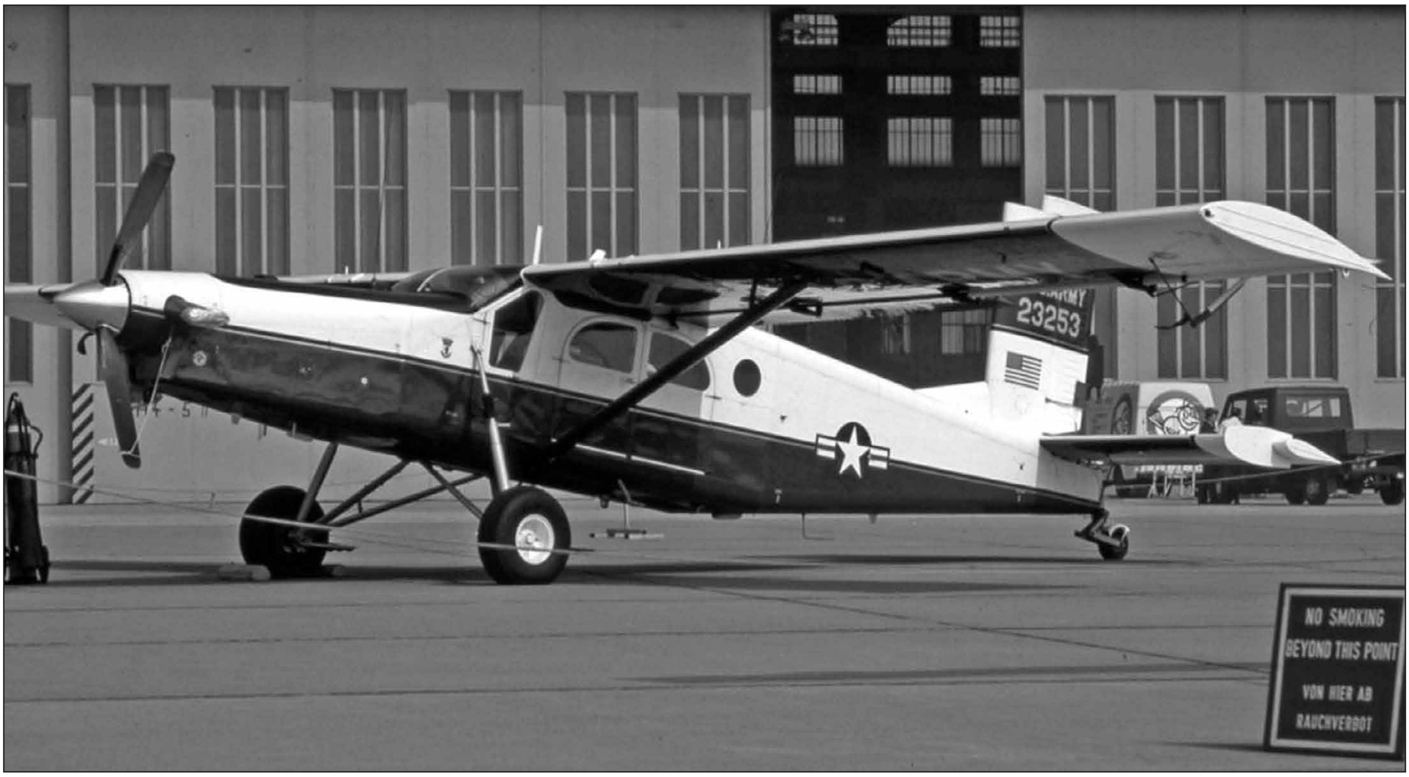
New aircrews followed a Detachment devised qualification course. As there was no 'Chiricahua' simulator available, unit pilots went to the Pilatus factory for currency training, the aircraft's deeper servicing work was also carried out there. The UV-20 was popular with both air and ground crews because of its simplicity and robustness. Very adept at short take-off and landings one 'party

FOXBATS

The edge of the BCZ ran part of the way through Werneuchen AB on the north-east of Berlin. It was of special interest to the three Allies because MiG-25 Foxbats were based there from the 1970s. This was the only location where these remarkable aircraft could be regularly seen at close quarters and so was a regular target for Allied aircraft. If something 'special' was happening on the airfield it was not unusual for aircraft from all three Allies to be in the vicinity at the same time. Virtually every aircrew member who



On the very edge of the BCZ, Werneuchen airfield was a persistent target for Allied flights. In the foreground, is the airfield's protective SAM-4 battery and more distant, the airfield. Hand-held shots like this were occasionally collected for training purposes. (Sam Baker)



Pilatus UV-20A 'Chiricahua' photographed at the 1981 Tempelhof Open House. Their high wing, large side doors and ability to fly at very slow speeds made them excellent photographic platforms for Operation Lark Spur missions over the BCZ. (Ralf Manteufel) has flown Corridor missions, or with the US Berlin Aviation Detachment, had recollections of Werneuchen. These normally involved close flybys by Foxbats or sometimes helicopter activities attempting to drive away the unwanted intruders. As Sam Baker recalled: 'We experienced an unintended (very) near miss with a pair of Soviet MiG-25s who were departing westbound out of Werneuchen. That, and the subsequent interception by the same pair of aircraft as we were approaching Tempelhof for landing proved memorable for USAFE's Deputy Commander who was flying with us that day'. There are many similar crew recollections.

There was always a high level of intelligence interest in the MiG-25 Foxbat at Werneuchen. A MiG-25RBch reconnaissance version (Foxbat D) is shown on the final approach to land. As the airfield was bisected by the edge of the BCZ, it was one of the best locations to 'catch' the aircraft. (Rob Schleiffert)

Werneuchen based helicopters like this Mi-24V Hind, were regularly used to chase away OP Lark Spur and other Allied light aircraft away from the airfield. (Eric Bannwarth)

piece' was to use the cross taxiway that connected Tempelhof's two runways to land and take-off if there were strong crosswinds.[14]

By 1990, the Berlin Aviation Detachment manpower establishment was 21 soldiers and 16 civilians, including several German mechanics responsible for unit-level maintenance and technical inspections alongside the six US Army crew chiefs. Together they were responsible for maintaining the unit's six UH-1Hs, two UV-20As, and a single C-12 used for longer range inter-European transport. The Detachments 10 pilots were unusually rated to fly its helicopters and fixed-wing aircraft. Two Detachment pilots were qualified in all three types. Newly arrived aircrew normally took six to nine months to mission qualify on the UH-1Hs. The two UV-20As left in August 1991 as US activities in Berlin wound down. After the fall of the Wall, operations continued for some time, observing changes to the City and eventually, preparing for Allied withdrawal from Berlin. The Aviation Detachment deactivated in 1994.

7

LIVING AND WORKING ALONGSIDE THE RED ARMY

In the enclave of West Berlin, Allied forces were surrounded by the Soviet and East German military and the IGB effectively divided a continent into two worlds. On the ground, there were the formal, nearly always polite interactions between the Four Powers in the BASC. In contrast, the men of the Allied Liaison Missions engaged in a formally polite relationship with the Soviet Army. Beneath that veneer, they engaged in daily 'hand-to-hand liaison' with the Russians and East Germans as they sought, often at great risk, to also collect detailed intelligence about their opponents. Those that flew the Corridors had a unique birds eye view, able to watch their opponent's activities on a near-daily basis. The same applied to those in dark rooms that listened in on Soviet and East German communications transmissions and messages attempting to discern their meaning.

The atmosphere around those contacts on the ground could be affected by many factors including international political events, the general state of East-West relations and local Berlin centred disputes. Particularly when tensions between the two sides were high, it was those in daily contact, effectively military-diplomats, who needed to act with cool heads to keep the contacts as cordial as possible, to prevent them from deteriorating further, or even spinning out of control. Over the 45 years, many events tested the skills of the military personnel placed in the unique operating environment of Cold War Berlin.

Working in the BASC

Perhaps one of the most unusual military jobs in the Cold War US military was working in the BASC. Their job was to successfully authorise air traffic moving in and out of West Berlin. Staffed by representatives from all four wartime Allied powers, the Western representatives were in continuous daily contact with their Soviet counterparts and had to develop good working relationships with them.

NATO was wholly focused on countering the Soviet threat. If deterrence failed, there were detailed and regularly exercised reinforcement and war plans to counter Soviet and Warsaw Pact aggression. A vital part of the Cold War Western response was the collection of intelligence on the Soviet threat. Indeed that was the *raison d'être* for the Corridor intelligence collection flights that worked relentlessly, observing Soviet and East German military movements, attempting to uncover their secrets. The Soviet Union was very clearly, the adversary. Yet within the BASC, representatives of all Four Powers had to cooperate and successfully work with each other if the West were to maintain the Berlin outpost. Of all the US military personnel spread across the world, none had more regular contact with the Soviet military than the staff at the BASC. It was a role that was sometimes misunderstood, regarded with great suspicion and outright hostility by some other members of the US military.

The task of BASC personnel would most accurately be characterised today under the title of 'defence diplomacy', a term that only gained currency after the end of the Cold War. Then Lieutenant Colonel Rick Fuller was a US Controller and later, Chief Controller at the BASC from 1985 to1989 and so had a rare and unusual perspective on East-West relations compared to many others. Before being posted to the BASC, Rick was a 'standard' C-130 pilot with the 37th TAS at Rhein-Main AB from 1981 to 1984 and during that time, had made occasional 'trash-hauling' flights into Tempelhof AB.

> Flying out of Rhein-Main to Berlin we generally used the Southern Corridor. Before you could fly these missions as a pilot there was an administrative requirement that you had to be 'Corridor Qualified'. You had to be well aware of the Corridor limits, altitude restrictions, and bad weather procedures, although the C-130 was well known for being able to plough through all but the very worst weather. We followed the Corridor centre line, the biggest thing was not to stray out of the Corridors into East German airspace, or as we regarded it, over the Soviet zone of occupation. The qualification required some education and then testing ahead of the check ride. The flights themselves were not very remarkable, more about exercising our rights of access than anything else. Given that weather along the Corridors, especially during winter, often meant we could not see the ground, made us reliant on our navigators to position us properly in the Corridor'.

> Rick explained how he moved to a posting within the BASC.

> The job at BASC was outside the flying environment and I became interested after advice from a buddy of mine who said he knew I would find it an 'interesting assignment'. I went to Berlin for an interview and was successful so opted to move there. In my operational world of pilots, several senior officers viewed it as an 'odd ball' assignment, one that would not advance my career.
>
> Our brief was not very thorough, to say the least. We were told the basics of the job: exchanging information with our three allies and coordinating with them the movement of aircraft in the quadripartite airspace of the BCZ and the Corridors. Aircraft movements were limited to military aircraft from the Four Powers and civil aircraft, from designated national flag carriers like Air France, Pan Am, Dan Air and British Airways, plus occasional military chartered aircraft for personnel and freight movements. The Soviets did not regularly coordinate their movements because they only rarely used the Corridors. We approved specific flight movements and coordinated those with the Western Allies and communicated the flight details to the Soviets.
>
> We were taught the mechanics of the job but not much else and learned primarily, by sitting with someone for a few days before starting to do the tasks ourselves. It was not a difficult job but required diplomacy and having a thorough understanding of our rights and obligations in the use of the airspace. I asked soon after my arrival if there were any limitations on what we could talk about within the BASC setting. I received a very specific response, that there were no limitations about what we could discuss and how we could interact. We were just told to be ourselves and do a good job. Because of our continuous contacts with all the other BASC members, we developed significant friendships with our colleagues: British, French and Soviet'.

The four BASC Senior Controllers on the steps of the *Kammergericht* building in 1989. From left to right: then Major Rick Fuller, Wing Commander David Pollock, Colonel Claude Favier and Colonel Boris Shunin. (Chief Master Sergeant Don Sutherland)

One of many tours being shown over the BASC control room. Captain Dave Briskey is briefing General John Hyde from HQ USAFE and US visitors while British, French and Soviet representatives continue their work. (USAF/RAMI Harcsztark)

I thought of the job as requiring two hats – a military one and a political/State Department one. We were military personnel doing tasks required by our commanders. However, if there were Soviet objections to our flights, we had to refer back to our political masters at the State Department to clarify what was going on rather than through our military chain of command. The State Department was our day to day boss. During my time in Berlin, I never received a military direction from my USAFE boss 300 miles away at Ramstein AB. We were not very visible within the USAFE command structure.

I feel, as US representatives, we had a little more latitude to operate than did the other Western Allies in their official exchanges. Our State Department contacts were mainly with the US consulate in West Berlin, part of the US Berlin Mission at Clayallee. The main US embassy was on the Eastern side of the Berlin Wall, a short distance from the Brandenburg Gate. I reported to a Political Officer at the consulate each evening. These were mainly very routine details, but if anything of interest or controversy was raised at BASC, he took it to his manager, down the hall in the consulate political section.

Our basis of operations was as four wartime allies from Second World War, even though in the real world, we operated in a political situation where the three Western Allies were against the Eastern one. But in our daily operations and the BASC environment, we were obligated to operate as four allies working together. That always underpinned what we did, but there were no personal animosities in our daily business, we worked cooperatively and in a friendly manner, but with a recognition that we were speaking on behalf of the separate sides of the divide. We were representatives of our countries, we were military people, but had to work daily together on a very personal basis. We exchanged comments, jokes and occasional barbs. The Soviets we worked with were similar to us, some more indoctrinated than others, but never anyone who was hardcore.

The BASC operated on a 24-hour basis. The Americans and British worked to a two-shift a day system, while the French and Soviets worked 24-hour shifts.

There were always two Soviets on duty – a controller and translator/interpreter. Some were certainly from the GRU/KGB, but we soon got a feel for who they were in our routine daily interactions with them. The Centre was manned 24 hours a day, every day, although there was never air traffic after 2300hrs or before 0700hrs each day. Because of that, we got to spend considerable amounts of time with everyone and got to know the backgrounds of individuals.

I regarded a fair bit of my job as almost ‘social’ to ensure things went smoothly. About every four to six weeks, we would have a ‘hail and farewell’ evening party that involved all four representations in one of our rooms set aside at the BASC. Only Centre members would attend, no one from outside, just those working together on a day to day basis, accompanied by their wives. We would have a large ‘multicultural’ dinner, socialise afterwards and generally have a good time. It was a very relaxed collegial experience. But it was interesting to watch the new people, from all four countries, who were always a little reticent at first and held themselves back. They had a ‘breaking in’ period before they became comfortable working in the quadripartite environment and realised that in this very specific situation, we were friends and allies. Although relations with the Soviets were improving during my time, we were well aware that particularly during periods of tension between East and West, we, the BASC, was one of a very few contact points with the Soviets.

The BASC was an organisation of interest to a great number of people. Many wanted to get a look over the very large and impressive fenced-off compound that housed the BASC at Kleistpark, guarded by the US Army. It seemed that everyone wanted to see the building and meet a ‘real Soviet’. We had lots of official tour visitors, sometimes three to four groups a day. They could be British or French but were mostly American. Soviet groups tended not to visit, as that meant that they would have to cross from East Berlin to the West. Of the US groups, there could be congressional representatives through to Agency heads from Washington. But every Friday morning we had a tour, normally from a US military flying unit, like a fighter squadron. They brought over some of their pilots and wives for a two/three day stay in Berlin to give them a better idea of the special situation there.

Some of the fighter units were well indoctrinated in their role and were always ready to ‘fight the enemy’. It was what was expected of them after all. Some would glare at the Soviet representatives when they came to the control room. So, while we amicably worked with our Soviet colleagues daily, there was often

> some animosity expressed by our visitors towards them. Over time, this began to sadden me and made me realise that really, when it came to indoctrination about the adversary, both sides were as bad as each other.

That hostility was sometimes not only directed towards the Soviets. The BASC's sensitive intermediary role was sometimes not appreciated by the more hawk-like senior USAF officers. Rick expressed his frustration that on several occasions:

> At some senior officer meetings, Headquarters personnel very strongly expressed their view that US BASC staff members were in some way 'traitors' or disloyal because they were working alongside Soviet military representatives in a largely cooperative manner.
>
> In reality, BASC staff were simply fulfilling a career assignment given to them by the US Air Force, albeit a radically different one from most of the military. Although it had little classified content, the task required reliable staff able to resist external pressures, remain diplomatic in a sometimes highly politically fraught environment, keep the BASC functioning, stop any crisis from deteriorating further and provide another viable channel of diplomatic communication with the USSR'.
>
> I had become vaguely aware of the 7405th's activities during my previous posting with the 37th AS at Rhein-Main and my awareness of them grew for a couple of reasons. First, when I first started flying my usual C-130 cargo missions from Rhein-Main, I bumped into the commander of the 7405th who was an old acquaintance of mine from flying in Vietnam and he explained that he had an office in a different part of the flight line to us. Unsuspectingly, I said I would come down and see him sometime and his reply, which shocked me, was 'no, no, that's not going to work, perhaps we could meet at the coffee shop?'
>
> That began to alert me that things were happening on that flight line that I was unaware of and not privy to. Such that, even from the perspective of a friend who was the squadron commander, he could not let me into his building – then something unusual was going on. After that, I began to pay a little more attention to those other aircraft. The Air Force is a small world and you don't always have to be told much to be able to work out what is going on.
>
> When I went to Berlin, I had compartmented access to some of what the 7405th did and saw some of the results from these flights and the intelligence they produced. When we had issues across the table with the Soviets and asked questions about their air traffic movements and what their fighter pilots were doing in apparently harassing one of our flights, I almost without fail, already had the answers to the question provided by our intelligence community, before I raised the question with them in the BASC. That was a considerable advantage. It meant I was able to assess if the answers from the Soviet Controller showed that they had no real awareness of the issue under discussion or were simply being instructed by their senior officers to obfuscate or lie.

There can be little doubt that these sorts of assessments were made easier by having a good working relationship with individuals on the Soviet side.

> Although both sides repeated the official statements and protests as required, I do not believe the Soviet controllers tried to deceive us in the room. That would have been very obvious and destroyed the personal relationships and the confidence we developed in one another because although we passed official statements and protests back and forward as required, relationships in the room were very personal and relied on friendliness and trustworthiness.

Rick mentioned how BASC interfaced with live air traffic movements into Berlin:

> We also worked with BARTCC which I would describe more as a 'technical' organisation, assisting and monitoring real air traffic as it came into and out of Berlin. They were subordinate to us in some ways, in that they had to have our authorisation for clearance before they could accept control of an airplane. We mainly communicated with them via touch screens rather than telephones for the most part, although we had direct lines to them. Whilst BASC managed the airspace from a policy perspective, BARTCC controlled it operationally'.

BARTCC was staffed by controllers and technicians from the 1946th Communications Squadron at Tempelhof AB. The majority of their work was controlling aircraft in and out of Tempelhof and the Allied airfields at Tegel, with its longer runways that also handled civil movements and the much smaller, British airfield at Gatow. In the mid-1960s, this amounted to an average of '250 directs every day and monitored as many as 76,000 in one year'. This compared to a total of 277,569 flights into Berlin during the airlift with a peak of 2,764 in one day on Easter Sunday in 1949.[1] A staff of approximately 40 USAF controllers was supplemented by a small number of French and British counterparts, largely responsible for coordinating Tegel and Gatow traffic and assisting the USAF controllers and advising the Chief British Controller at the BASC.[2]

The 1946th Communications Squadron was a large one, made up of around 500 people in the 1960s. A significant amount of them were radar and electronics technicians who worked to keep the airfield landing aids and other equipment in good order. In addition to their routine tasks, a significant part of the technicians' other work was carried out in some secrecy. From the early 1960s, following the 1961 crisis and the erection of the Berlin Wall, they installed and maintained specialist equipment that was to be used in case the Soviets closed down road and rail access and a renewal of the airlift was required. Some of those systems were developed by the 'Big Safari' programme under the codename of 'Bamboo Tree' and included communication and radar aids that would be resistant to Soviet countermeasures.[3]

Rick continued:

> Within the BASC, work was very professionally conducted and mostly, formally. Certainly, any topic that may have affected internationally sensitive issues was always dealt with formally. Complaints about alleged unacceptable behaviours mainly came from us and were mostly about Soviet interference with our aircraft. Protests were all delivered very formally in a specific prescribed format mainly via pro forma documents which would be read to the Soviet Controller. Sometimes we got responses, sometimes not. If any specific issue was a significant one to us, it would be raised at the weekly Chief Controllers meetings that generally took place on Wednesday mornings. For more serious issues with possible wider political significance, we might get more State Department direction. We very occasionally read out very specific statements prepared by the State Department. Even as day to day relations improved during Gorbachev's period, business continued to be formally conducted.

Controllers from the 1946th Communications Squadron manned the Berlin Air Route Traffic Control Centre at Tempelhof AB. They directed traffic up and down the Corridors and inside the Control Zone. (USAF/Chief Master Sergeant Don Sutherland)

Although the BASC authorised air traffic movements, BARTCC controllers were responsible for often more than 200 daily movements in, out and around West Berlin's airfields and Control Zone. (USAF/Chief Master Sergeant Don Sutherland)

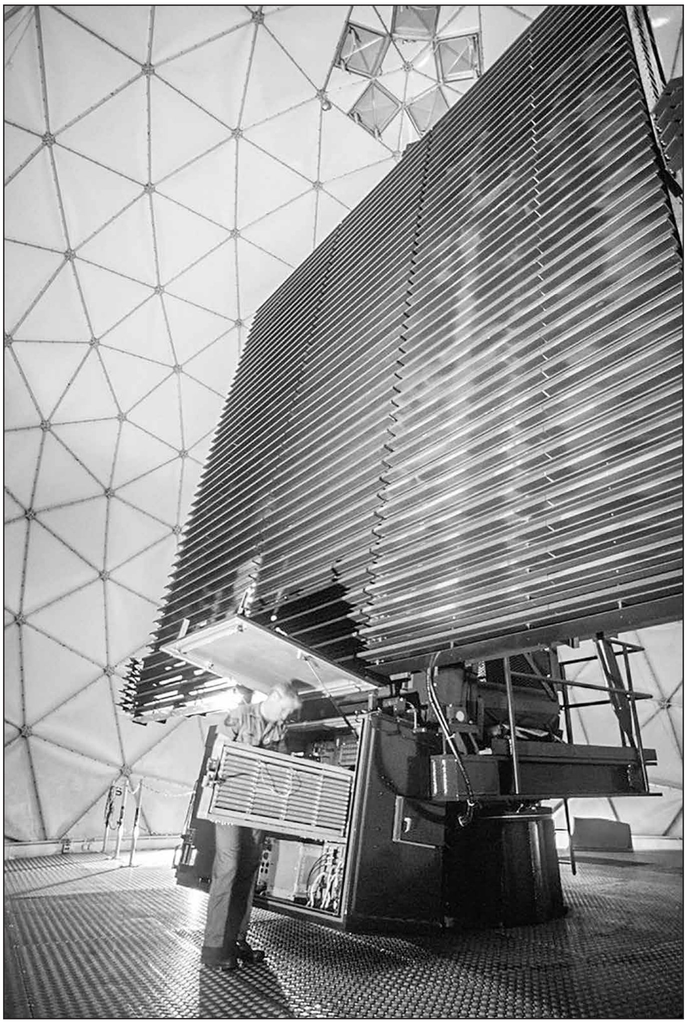
The good personal relationships allowed some gentle teasing in the control room. One day the Soviet Controller had taken a flight data slip from me for a US C-130 about to enter the Corridor and telephoned the details through to his colleague at the Soviet HQ in Karlshorst. After hanging up on the phone call, he handed the slip back to me across the table and said, 'spy aircraft, spy aircraft'. Naturally, there was nothing on the slip to identify it as such, so I just feigned innocence shaking my head and I saying no, no, just a C-130 bringing in supplies'. I sort of knew that it was a 7405th aircraft and of course, we both knew denying this was just a facade, but it was fine and we laughed about it.

Sometimes simply to exercise our rights of free movement around all Berlin, I would drive to the Eastern sector to wander around and was openly followed by Soviet soldiers in cars. On occasion, they simply boxed me in so that I could not move and had to get out and ask them to move back a bit to give me space to manoeuvre. Soviet BASC representatives were not allowed to mix with the Western Allies outside the setting of the BASC, but US staff were. Meeting them in West Berlin was very unlikely as they had to travel over each day from the East, but sometimes we discretely arranged to be at a particular restaurant or café at a specific time in East Berlin where they could 'accidentally' bump into us and have a friendly meal together and talk socially for a while. Not many people may have believed this, but such encounters were strictly social and helped strengthen working relationships.

In Berlin, the avenues of intelligence gathering and collection were many, varied and long-established, so I always believed we already had a very good idea of what they were doing, as they probably did about what we were doing. Perhaps oddly, that also made our work environment more 'liveable', in that although we collected and passed on some intelligence information, we were never at the forefront of such activities. There were many other and better sources available to the intelligence community than BASC.

As East-West relationships eased during his time at BASC, Rick said:

> I was often asked by our intelligence organisations, 'what are you hearing', not attempting to get hard information, but impressions of what the Russians' topics of informal conversations were and what interested them. What did they think of Gorbachev and Regan's relations? Given his popularity in the West, by contrast, Gorbachev was not popular amongst most Russians. They were very unhappy because he was turning their world upside down. The public admissions of Stalin's excesses and that Hitler had secret agreements with Stalin in the lead up to the German invasion of the USSR, rocked their world. I just gave them my honest observations and the intelligence folks respected the sort of unusual position I was in.



In 1984, a 72-metre high tower was erected at the eastern end Tempelhof's terminal building. On top of it, a new AN/FPS-117 L-band active electronically scanned radar system was placed and protected by a weather proof 'Igloo'. (USAF/Thomas Farr)

Given their daily exposure to Soviet military personnel, it should come as no surprise that Western BASC members were of 'intelligence interest' to the Soviets and sometimes propositioned by their intelligence agencies. As Rick explained:

> They would try to offer us all sorts of things in exchange for information. I was asked, 'what do you like Rick – gold, women?' and go through a list to try and tempt me. I would say, 'no that won't work with me, I am not interested'. In my years in Berlin and at BASC, I always made that very clear.

Similar approaches have been reported by the other Western BASC representatives. Potential opportunities in the other direction were not missed by Western agencies either. Western BASC representatives were to report items of potential intelligence interest they might gain and were sometimes approached by their intelligence agencies to discover potential openings that could be used to recruit or exploit members of the Soviet representation.

Straying Aircraft

Navigational errors – accidental and deliberate – along the IGB were not uncommon into the early 1960s, with NATO aircraft sometimes straying into GDR airspace. Many went publicly unnoticed, others resulted in diplomatic protests and minor international incidents. After the erection of the Berlin Wall in 1961, NATO and the Allied powers became much more concerned about the risks of penetration and potential loss of aircraft. This was well illustrated on 14 September 1961, when two West German Air Force F-84F Thunderstreaks made a major navigational error and flew deep into East German airspace.

Taking part in exercise 'Checkmate' they had taken off from Lechfeld AB to fly a route across Germany into France and land at Memmingen in Bavaria. On their route, they were to be intercepted by other NATO aircraft. Due to equipment and navigational failures, they were to the north of Leipzig before they realised their error and immediately placed a May Day call. Picked up by the French and facilitated by BARTCC, they were instructed to land at Berlin-Tegel airport and successfully did so, evading attempts by Soviet fighters to intercept them. Having broken just about every rule in the Four Power agreement about military aircraft using Berlin, West German Minister of Defence, Franz-Josef Strauss, apologised to the Soviet ambassador in Bohn for the incident; what, at some other time, could have become a major international crisis, quickly evaporated.

After the two aircraft landed at Tegel they were placed in a hangar. Rather than try to fly them out of Berlin they were buried on the airfield to be uncovered by new construction work in the 1970s.[4] This all happened just a few weeks after the surprise start of construction of the Berlin Wall, but the incident was safely managed. It would not be the last time Western aircraft accidentally strayed over the border, although the establishment of the ADIZ and buffer zone, did help to reduce the number of such incidents.

T-39 Sabreliner Loss

Flying in West Germany, particularly close to the IGB, could be hazardous and in some cases, fatal. 1964 was a pretty bad year for USAFE losses when two aircraft strayed into East Germany in separate incidents and were brought down by Soviet interceptors. On 28 January 1964, a T-39A 'Sabreliner' on a 'local training flight' from Wiesbaden, had inexplicably flown eastwards and crossed to the GDR at altitude where it was shot down by two Soviet interceptors – it crashed near Vogelsberg, killing the three crew. The USMLM dispatched teams to try and locate the scene of the crash.

After initially denying that any aircraft had crashed, Soviet forces tried to hinder access to the location declaring it part of a hastily designated Temporary Restricted Area (a standard procedure for them) and therefore, not open to USMLM personnel until some undeclared future date. Managing to lay up nearby, one mission observed the Russians searching through the debris. On 31 January, a small US convoy was allowed access to the site to remove the wreckage and repatriate the bodies of Lieutenant Colonel Gerald Hannaford, Captain John Lorraine and Captain Donald Millard.[5]

RB-66D Shootdown

The second loss occurred just a few weeks later on 10 March 1964; a USAF RB-66B electronic reconnaissance aircraft from the 19th Tactical Reconnaissance Squadron based at Toul-Rosières in France, was shot down near Gardelegen in East Germany, close to the Letzlinger Heide training area. The USMLM's 1964 Annual Report describes the flight as a 'local training flight'. It happened at a time when the Soviets were conducting a major exercise in the area where it was lost.

Other accounts have tried to portray it as a failed penetration mission to gather intelligence on a major Soviet exercise taking place on the training ground at the time. Most unlikely of all, several accounts have suggested the RB-66 was operating inside one of the Corridors but given the prohibition on their use by 'combat aircraft'

The East German Air Force (*Luftstreitkräfte der Nationalen Volksarmee* – LSK) operated a large number of MiG-21PFs, including JG-1 at Holzdorf outside the Southern Corridor. Their QRA aircraft were used to intercept intruders and aircraft straying from the Corridors. (Luftwaffe/LSK)

and the necessity to file a prior flight plan with the BASC, make it the least credible suggestion.

The Soviets had two Wittstock based, 33 IAP MiG-19s on CAP in their Northern Sector when the RB-66's intrusion was detected. Two more MiG-19s were launched by the Zerbst based 'QRA' flight and intercepted the RB-66 before the Wittstock aircraft did. As the US aircraft turned westwards, Kapitan FM 'Zinoviev' was told to engage it and brought it down with a salvo of four S-5 unguided rockets followed by canon fire.[6]

The 1964 AMLM annual report says that about an hour after its departure, the RB-66D disappeared from the radar screen as it approached the Soviet Zone of Germany in the vicinity of Gardelegen, north-east of Helmstedt. Within a couple of hours, USMLM teams were put on standby and soon departed to try and find the aircraft and its crew. By then, they believed the three crew members had managed to parachute from the doomed aircraft. Three USMLM tour vehicles managed to get close to the site but none were permitted access.

One of the crew, First Lieutenant Welch, suffered a broken leg and was subsequently treated at a Soviet military hospital in Magdeburg. He was returned to US custody on 21 March with the pilot Captain David Holland and Captain Melvin Kessler following on 27 March 1964.[7] Afterwards, the USAF went to considerable effort to demonstrate that it was a problem with the RB-66's compass that caused it to be mispositioned. The US has always firmly adhered to the 'navigational error' explanation, whilst the Soviets insisted it was a 'provocation' flight to test their air defences.

The French account of the incident offers yet another perspective. They had an N-2501 Noratlas 'Gabriel V', operating along the Southern Corridor at the time, and their listening post at Berlin-Tegel was active. Between them, they recorded the RB-66D flying towards the IGB and then being downed by the MiGs. It suggests that the RB-66D was operating near the entrance to the Central Corridor, where they believed it was attempting to identify a new Soviet radar. The intercepted radio exchanges were simultaneously translated and recorded by the 'Gabriel V' and the ground station and enabled them to triangulate the position of the RB-66D.[8]

Civil Aircraft Losses

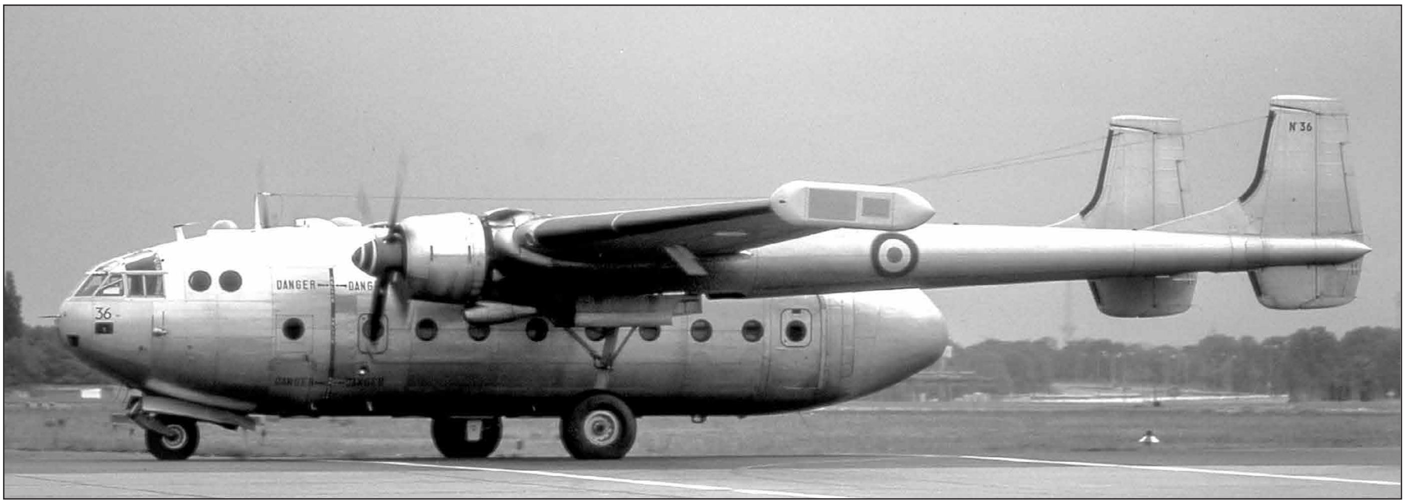
During the existence of the Corridors, several civil aircraft incidents resulted in serious loss and fatalities. The first was a British European Airways Vickers 610 Viking flight from Hamburg on 5 April 1948 which collided with a Soviet military Yak-3 fighter. As the Viking descended for landing, it was struck by the Yak which was performing aerobatics on the approach to RAF Gatow. The accident killed the 14 crew and passengers and the Soviet pilot.

On 29 April 1952, an Air France Douglas C-54A on a routine flight from Frankfurt to Tempelhof, was fired upon by two Soviet MiG-15s fighters that it was claimed had left the Corridor. Hit by approximately 89 rounds, the aircraft lost two of its engines but managed an emergency landing at its destination. Although some of its 17 occupants were seriously injured, none died.

On the night of 15 November 1966, a Pan Am Boeing 727-21 was flying from Frankfurt Rhein-Main Airport to land at Tegel Airport, rather than its usual Tempelhof destination. The aircraft impacted the ground near Dallgow, East Germany approximately 10 miles from Tegel. All three crew members died in the accident that happened in poor visibility in falling snow. After the accident, the Soviet authorities in East Germany returned only some of the wreckage, excluding the flight data recorder and other key parts of the airframe which meant the full cause of the crash remained undetermined.

The Nicholson Killing

Following the Soviet invasion of Afghanistan in December 1979, East-West relations went particularly sour and the work of the Allied Military Liaison Mission became even more dangerous. It was during this period that there were two fatalities. French Adjutant Chef Mariotti of the MMFL was killed in a deliberately engineered traffic accident with a Soviet convoy in 1984. On 24 March 1985, Major Arthur Nicholson of the USMLM was shot and killed by a Soviet guard close to an armoured training area and machine gun range known as 'Ludwigslust 475', northwest of Berlin.[11] He had covertly approached this unfenced Soviet facility through an adjacent forest to look at the site – not an unusual activity for MLM



A French Air Force Nord N2501 '*Gabriel*' operating in the Southern Corridor on 10 March 1964, recorded the downing of a USAF RB-66D. This aircraft is No. 36 of EE54 at Berlin-Tegel in June 1974. The wingtip bulge is the interferometry antennae for its 'Ferret III' system. (Peter Seeman)

POLISH HIJACKINGS

On 30 August 1978, a Polish Airlines TU-134A, LOT Flight 164 from Gdansk to Berlin Schönefeld, was hijacked and landed safely at Tempelhof with 62 passengers aboard. The hijacker, East German waiter Detlef Tiede, accompanied by Ingrid Ruske and her young daughter, had brandished a starter pistol purchased in Poland. Tiede surrendered the weapon and he was taken into US military custody. Seven others on the aircraft took the opportunity to remain in the West, although one soon returned to the GDR, concerned about the consequences her parents might face if she remained. It soon became the pattern for a large number of hijackings over the next few years that brought escapees from Poland to the West, via Tempelhof airport.

As the crisis in Poland deepened during 1980, there was an extra edge to AMLM and Corridor flight activities as everyone looked for signs of a possible Soviet intervention. The political situation in Poland continued to deteriorate, especially following the introduction of martial law in December 1981. Amongst all the scheduled military and limited airline traffic that arrived at Berlin Tempelhof, there were increasing numbers of unexpected arrivals. Poles who were desperate and determined to escape started hijacking aircraft of the Polish nation airline Polskie Linie Lotnicze (LOT).

In what by now, had become a well-worn procedure, on 22 August 1981, another An-24 SP-LTO from Wrocław to Warsaw diverted to Tempelhof after Solidarity member Jerzy Dygas held up the aircraft. His passport had previously been confiscated by the Polish authorities after an earlier escape attempt in 1979. He said he 'knew to come to Tempelhof because of the publicity surrounding earlier hijackings to West Berlin'.[9] It should be no surprise that by this time, some Berliners joked that the initials 'LOT' now stood for 'Landet ooch Tempelhof' (also lands at Tempelhof). Hijackings became so common that some aircraft were on their second unscheduled visit to Tempelhof. On 30 April 1982, An-24 SP-TLG arrived again, this time with 57 people on board including the five crew and six security guards.

On 22 November 1982, when a 22-year-old Polish 'sky marshal' Piotr Winogrodzki, armed with two hand grenades, decided this was his opportunity to leave Poland. He was placed on the flight to supplement two other security guards along with the An-24s 31 passengers and four crew. East German MiGs had escorted the An-24 over East Germany and the aircraft landed uneventfully. However, before the Antonov came to a full stop, Winogrodzki opened the aircraft door and jumped from the moving AN-24. One of the other guards appeared in the open doorway and opened fire, missing him and he escaped with just a minor foot injury from his jump.

On 12 June 1982, three young men (one holding a pilot's licence) overpowered a guard at a sports club airfield North of Wrocław and broke into a hangar. They painted red stars on the YAK-12 and flew roughly

On 30 August 1978, a Polish Airlines TU-134A, SP-LGC, flying from Gdansk was hijacked by East German waiter Detlef Tiede who forced the pilot to land at Tempelhof. The aircraft is taxying for departure after the peaceful conclusion of the incident. (Ralf Manteufel)

members. Next to the tank parking shed were some training display boards. Nicholson and his driver had failed to notice a young Soviet conscript who fired three shots, fatally wounding Major Nicholson. The tour NCO could do nothing but remain in the tour vehicle and watch. He was not permitted to give Major Nicholson first aid and he received no medical attention from the Soviets, dying at the scene.[12] The immediate result was a stand-off at the site for several hours, the start of a major international incident and a substantial souring of mission relations in Germany that lasted for some time.

The day after the shooting, a 7405th OS C-130E was tasked to fly down the Northern Corridor to photograph the incident site. This large area, like many Soviet military bases, was unfenced, but the resulting mission imagery revealed that whilst there was there no fence before the shooting, one was being frantically erected around part of it by Soviet troops.[13]

At the local level, it substantially affected relations with the Military Liaison Missions and the BASC and the normal range of military-diplomatic contacts were cancelled or severely curtailed. Whilst these may be regarded as relatively insignificant steps, they considerably affected the levels of military and border tension in and around the City for some time.

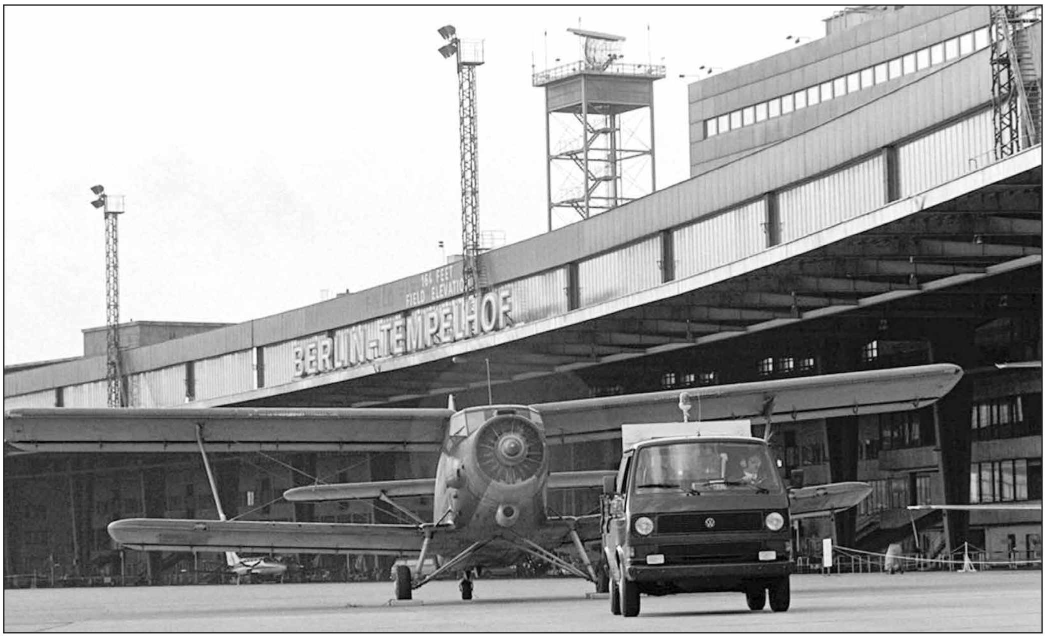
Rick Fuller described its ramifications in the BASC:

> There were sometimes real political tensions that arose from local events and around the world that has a quietening effect on the control room at times. On occasions, we were instructed, that if a certain politically controversial issue of the day arose, we were simply not to discuss it with the Soviets. That sometimes brought a bit of tension to the shift, not personal, but it framed the atmosphere in the working environment for some time. The shooting of Major Nicholson was one such incident that caused a great deal of tension in the BASC.

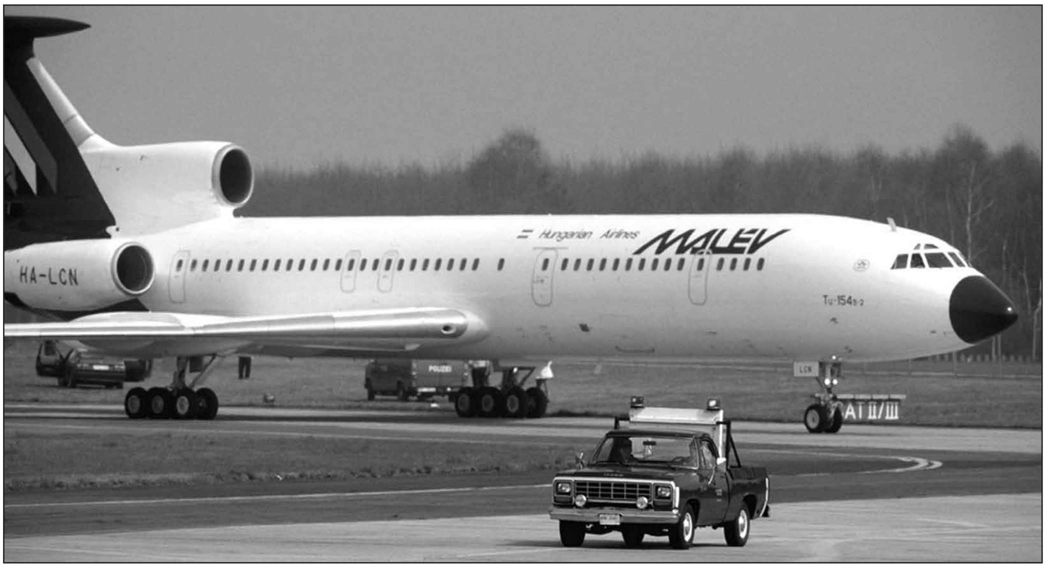
150 miles at treetop level to reach Tempelhof where they successfully landed and requested political asylum.

Increased security measures and the lifting of martial law in July 1983, seemed to put an end to the hijackings. However, escapes continued and during 1983, at least one An-2 and a small number of YAK-12s were stolen from other Polish flying clubs and landed at Tempelhof.

Sometimes, US personnel in West Germany would get pulled into hijack events. On 29 March 1989, two Czech teenagers hijacked a Hungarian, Malev Airlines flight in Prague. Armed with a sawn-off shotgun and a rifle, they had seized a hostage and forced their way onto the TU-154B, discharging a single shot into the air. They released 82 passengers already on board and forced it to fly to Frankfurt with the 11 remaining passengers and four crew. There, they parked on the commercial side of Frankfurt airport (its original destination), having been denied access to use the Rhein-Main ramp. Escorted across by US military vehicles, they soon surrendered to the West German authorities.[10]



On 17 September 1983, a Polish AN-2 (SP-ANK) was stolen and flown to Tempelhof. Here it is carrying out an engine check on 20 September prior to its return flight to Poland piloted by Janusz Krasicki and his flight engineer. (USAF/ Thomas Farr)



A 'Follow Me' vehicle guides a hijacked Hungarian Tu-154B airliner to the civilian side of Frankfurt International Airport on 29 March 1989. The two teenage Czechoslovakian hijackers were detained. (MSgt Bill Thompson)

Falling Tensions

Unknown at that time, something fundamentally far-reaching was just beginning. Less than two weeks before Major Nicholson died, Mikhail Gorbachev was elected as Chairman of the Communist Party of the Soviet Union. Rick continued:

> During my time in Berlin, we were beginning to have better relations with the East. Under Mikhail Gorbachev, relations opened up and although most of us welcomed it, our Soviet colleagues did not. They saw him as turning their traditional world upside down, fundamentally challenging and changing their beliefs and political culture. Similarly, that resentment of political change was replicated by some at senior levels in the Pentagon, many of whose whole careers were predicated on a Soviet Union ready to go to war with us at a moment's notice and who sensed that the strategic environment was experiencing seismic change.

That change was indeed seismic; Gorbachev looked to correct the huge economic difficulties the USSR was facing, including its underwriting of all the Warsaw Pact governments. The security environment also eased as East-West conventional disarmament talks began to make real progress. Then came the signing of the Intermediate Nuclear Forces treaty in 1987, which agreed the withdrawal of this class of nuclear weapons that had been such a source of tension between the two sides for the previous 10 years. On the ground in Germany, the scale and seriousness of Soviet military exercises began to significantly decline. These changes were soon noticed by the Corridor flights and the Military Liaison Missions.

However, when the end came, it was sudden. The fall of Janos Kadar, leader of Hungary since the 1956 uprising, opened up the path of radical reform for communist regimes in Eastern Europe. By the time the Red Army began its agreed withdrawal from Hungary in April 1989, the Protestant Church in the GDR had become the focal point for those seeking to loosen the grip of the state. Gatherings and quiet demonstrations grew until the East Germans could no longer ignore them. An escape route to the West was created from the GDR when Hungary eased its border controls with Austria in August 1989. Soon large numbers of people began exiting the GDR via Hungary.

Gorbachev's visit to East Berlin on 7 October to celebrate the 40th anniversary of the GDR hastened the end of the Socialist Unity Party's (SED) monopoly on power. Unpopular at home, Gorbachev was welcomed in Berlin. The GDR's Eric Honecker had expected the Soviet leader to support his SED regime, backed with military force if necessary, to stem the growing crisis. Gorbachev simply washed his hands of the GDR declaring, 'I should tell our Western partners that matters relating to the German Democratic Republic are decided not in Moscow, but Berlin'.

With no public guarantee of Soviet support for Honecker's hard-line regime, the unravelling accelerated. By 18 October, Honecker was gone and replaced by conservative Egon Krenz. Just over three weeks later, amid chaotic scenes and much confusion, crossings between East and West Berlin opened up. From that moment, it was just a question of how to wind up the existence of the East German state and create a united Germany, a process with significant problems of its own.

The reality of a unified Germany meant the Four Power presence was obsolete and was rapidly scaled back before the total withdrawal. The Allied Control Authority was officially dissolved upon German reunification. US Corridor missions carried on after the fall of the Wall and continued to monitor the changes taking place to the Soviet and East German force structures. Their final mission was flown on 29 September 1990, just a few days before formal German unification and the disappearance of the Air Corridors. However, until a new structure for the management of East German airspace was put in place, some USAF personnel remained to work under the supervision of the *Deutsche Flugsicherung* (DFS) until Berlin Air Route Traffic Control Centre was finally closed on December 31, 1994.

When US flights halted, they had flown 'more than 10,000 missions patrolling the Berlin Corridors and siphoning intelligence from the very heart of the Soviet presence in Europe'.[14]

8

AN OUTSTANDING ACHIEVEMENT

I started this book by saying that Berlin was just one corner of the US worldwide intelligence collection programme, which indeed it was, but it yielded valuable intelligence far beyond its size. A great deal of effort was taken to ensure that the aircraft involved in these operations could very effectively, hide in plain sight. These were not the obvious 'spy planes' like the U-2 or SR-71, or even the RC-135s, modified aerial tankers festooned with aerials and odd bulges. They were commonly seen transport aircraft, internally transformed by the sophisticated equipment and the operators they carried. Great thought was put into making these aircraft look externally indistinguishable from their standard 'trash hauler' relatives when they sat on the flight line. By flying these missions, several times each week for 40 years, they enabled an extremely detailed picture of Soviet and East German military capabilities and intentions to be established. Indeed, this produced a more detailed time series intelligence study than was possible anywhere else in the world.

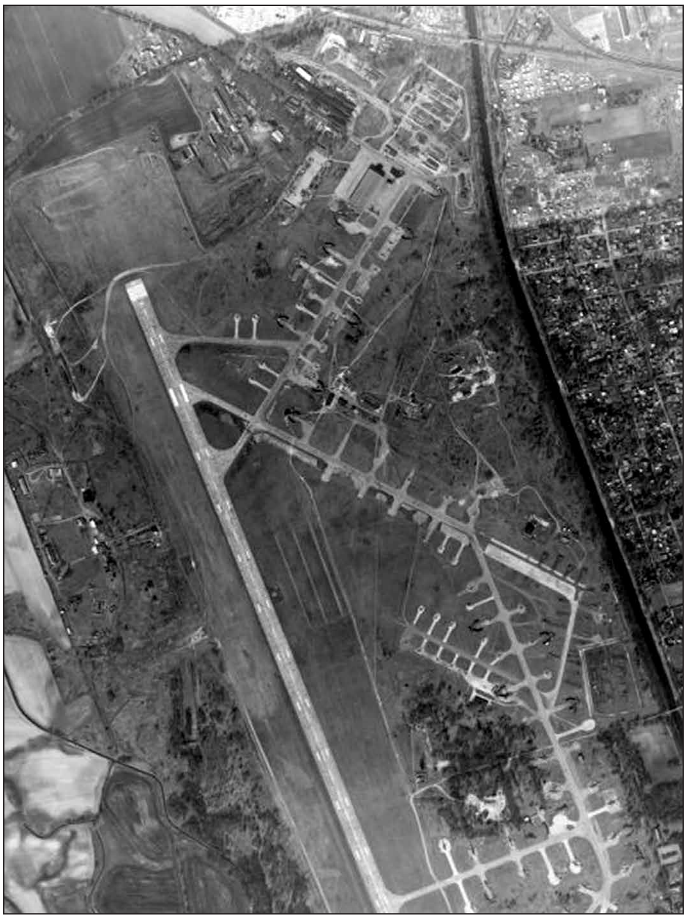
The Corridors and Berlin were vital reconnaissance targets for additional reasons. For much of the Cold War, there was an expectation that any 'hot' war would involve a massive Soviet tank advance across West Germany. That meant there was a huge concentration of their forces in Germany. In the East, the Soviets vast defence expenditures meant there were often insufficient resources left for the construction of much in the way of new, modern military bases. Therefore, large numbers of former Nazi airfields, logistics bases and barracks around Berlin were pressed into use by the Red Army, sometimes barely repairing them at all. They housed great numbers and a wide variety of forces. For the Soviets to have built new infrastructure out of view from Corridors and the MLMs, would have been almost impossible and absolutely prohibitive in cost and resources.

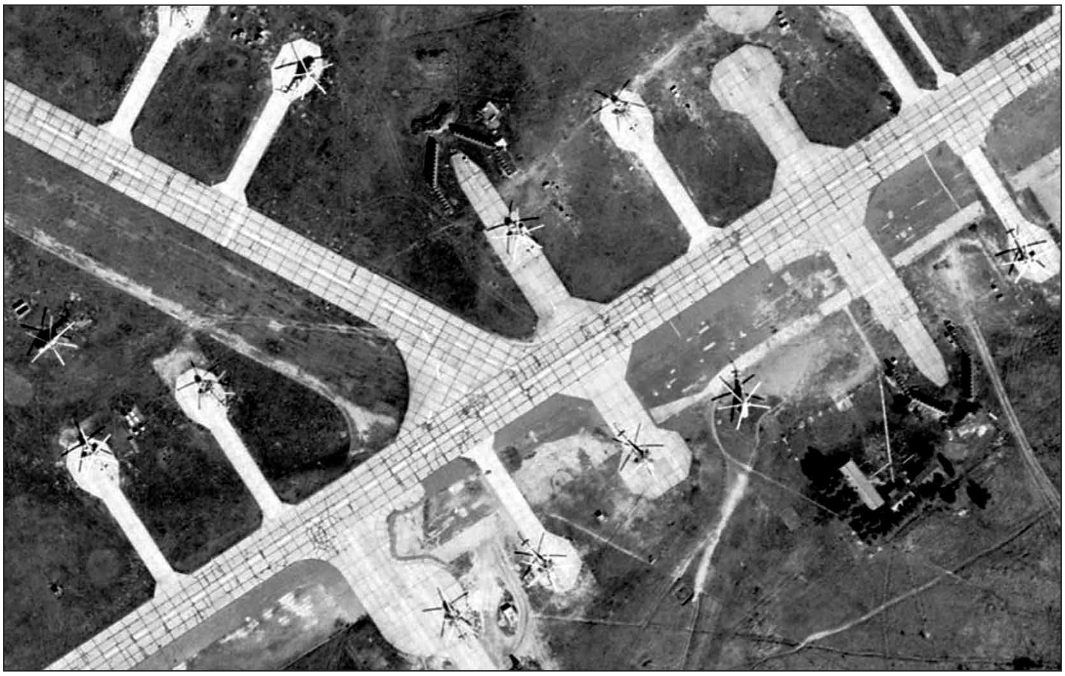
Not only were many of these facilities observable from the air, but many became targets of the AMLMs able to move around on the ground, engaging in never-ending ‘liaison’ determined to uncover every military secret they could. Scouting around and hiding up close to the boundaries of these bases wherever possible, sometimes entering weapons ranges to recover bits of ordnance, climbing over Soviet transport trains and even rummaging through military rubbish dumps, also revealed vast amounts of intelligence. Such extensive combined air and ground reconnaissance provided an unrivalled mosaic of the structure and operation of Soviet forces.

However, it was not just a question of the quantity of the Soviet forces present that made it important, it was their quality and variation. The comparative concentration of military infrastructure around Berlin and observable from the Corridors, meant that it was not just a location for ordinary infantry and armoured combat units. There was a complete range of specialist troops and equipment visible – optically and electronically. They are impossible to comprehensively list but included: chemical warfare units, river crossing engineers, rocket troops, communications units and equipment, combat engineers, SAM batteries, special weapons stores and Spetsnaz forces, to identify just a few. In addition, years of observing annual Soviet troop rotation patterns, the performance of conscripts, the movement of equipment, especially by rail, operational routines and exercises all added to the vast density of intelligence gathered.

Another question sometimes raised is whether there were any benefits to the Soviets of these near-constant Allied overflights? Periodically, Soviet forces would put on equipment displays for their senior officers. They would show examples of each equipment item to be found in particular types of formation or sometimes a themed equipment display showing a particular capability which often included their newest equipment. These were often done under, or close to, the Corridors where they would have been easily visible.

The Colbitz area of the Letzlinger Heide, under the Centre Corridor, was one frequently used location where such displays were mounted. Were these just a function of being the most convenient place to mount them or could they have been to demonstrate to the Western Allies Soviet power and prowess? In a counter view, there is plenty of evidence that indicates Soviet forces sometimes went to considerable effort to conceal the presence of new or specific, equipment items until they were ready to reveal them or it was unexpectedly discovered.

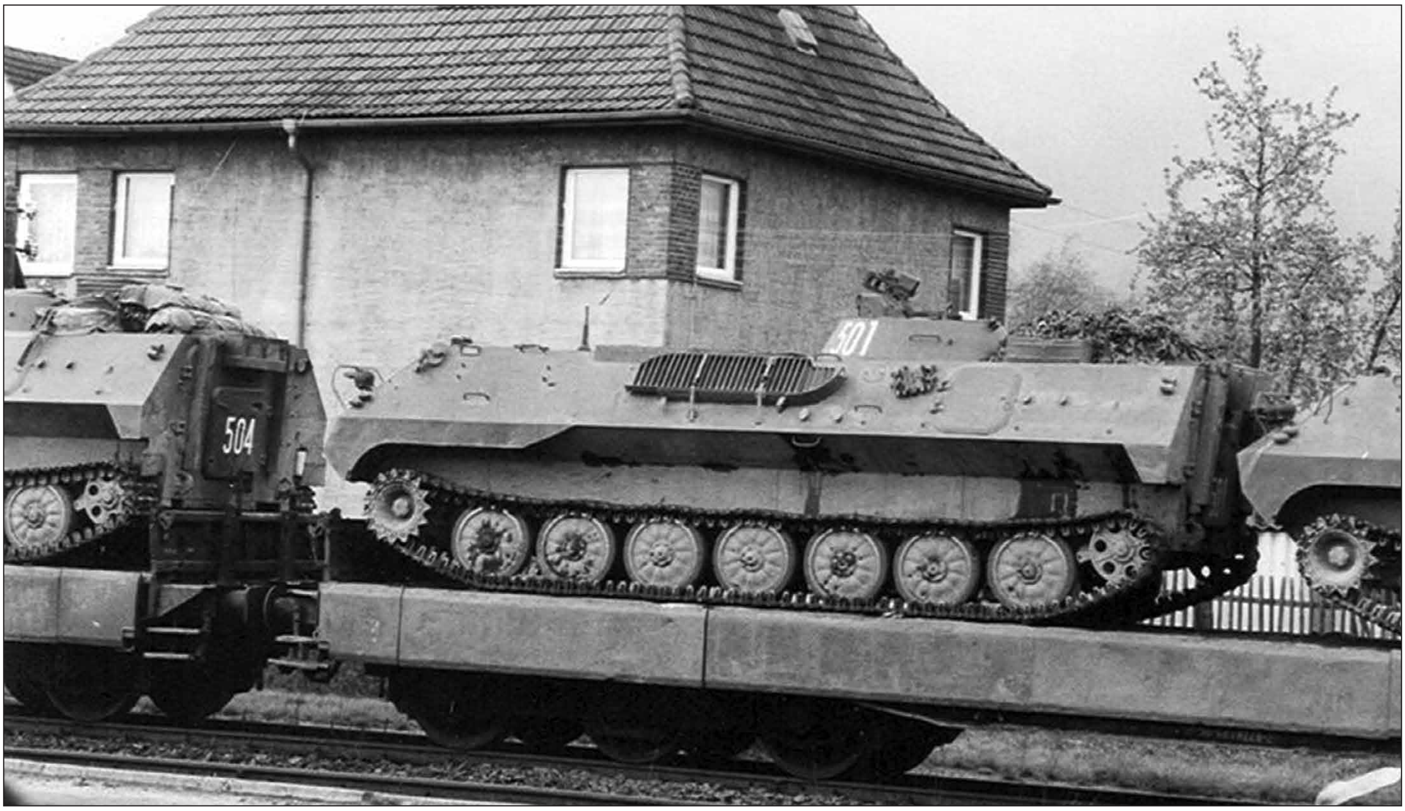




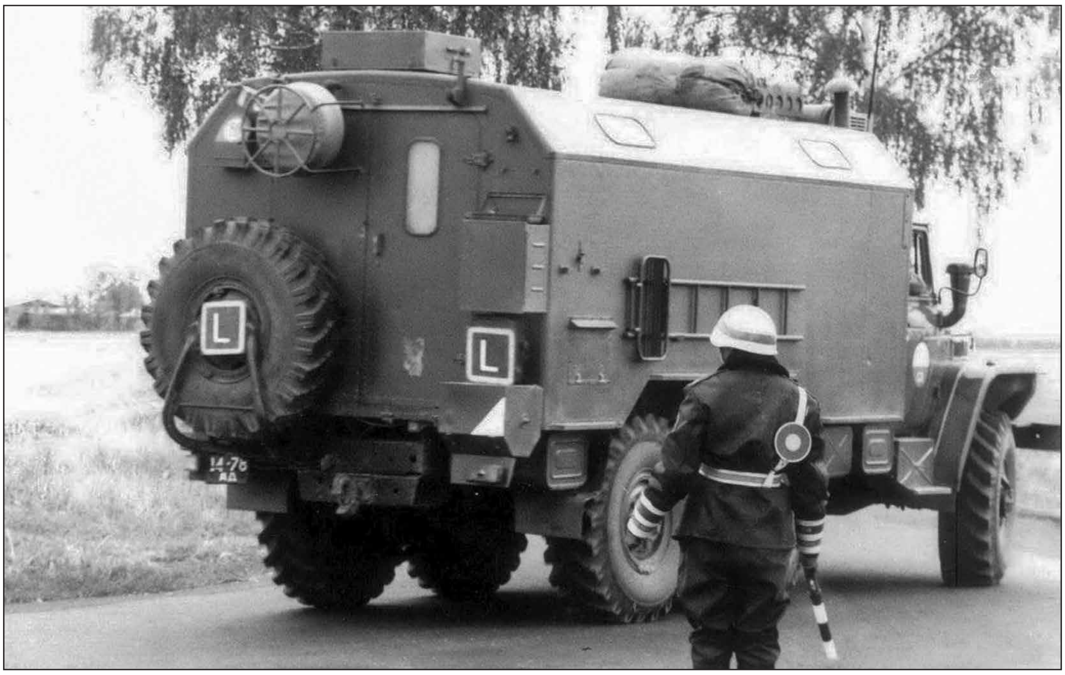
By the 1980s, Oranienburg inside the BCZ, was a busy helicopter base and barracks, with transport aircraft also regularly passing through. The airfield had large numbers of helicopter hardstands and was renowned for its poor infrastructure. The many large holes in the hangar roofs meant little could be completely hidden. (Crown Copyright via Medmenham Collection)

Rick Fuller offered some observations about Soviet forces:

> When the Wall came down and we began to mix more with the Soviets, now, in retrospect, we were a little surprised at the lack of technology and the relatively primitive way the Soviets managed their use of the airspace. We assumed that they had the same levels of equipment and trained controllers and that was not what we discovered when we visited the East. We were rather surprised at how old fashioned, and outdated their air traffic system was. It was more procedural like ours had been in the 1940s and 1950s, than the more direct control, using modern equipment and highly trained people that we had.
>
> I remember one other surprise from those early post wall exchanges. It was the expression by senior Soviet officers that



Military train watching and photography was a regular activity for USMLM members as they monitored the movements of Soviet hardware in the GDR. (USMLM/George Partridge)



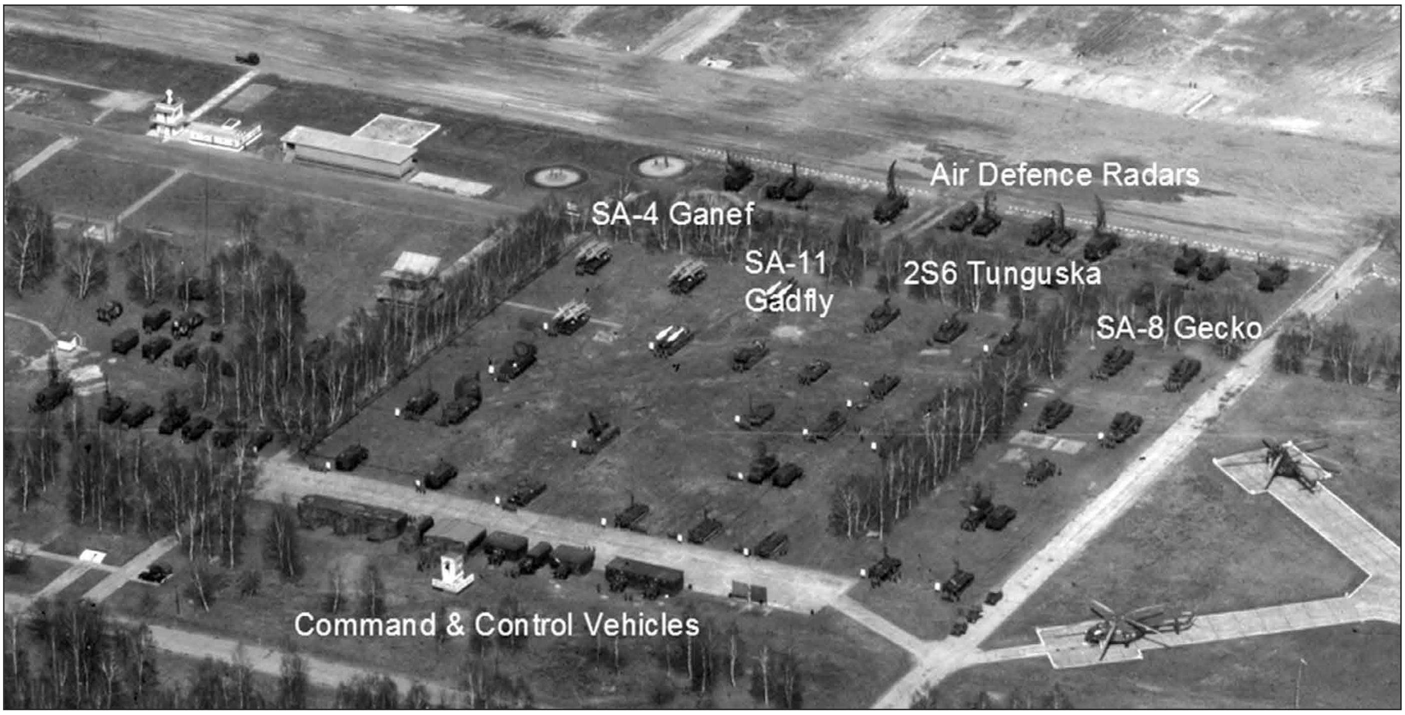
Soviet 'Reggies' were dropped off at road junctions ahead of Soviet convoy movements to direct traffic, as troops did not have access to maps as a matter of routine. They were a strong clue to MLM tours that something was going to happen. (USMLM/George Partridge)

Allied soldiers had such ready access to maps. They did not allow their soldiers to have access to the maps of the 'bigger picture' or knowledge of the overall plan. This was supported by our conversations with Soviet officers in the BASC, about how they would be given an order and simply expected to do no more than instructed, without any awareness of the wider objectives, plans and goals. Within the Red Army, decision-making capabilities certainly did not extend down to soldiers or even to mid-level officers, the captains, majors and maybe even the colonels.

Soviet knowledge of US Corridor activities

One very big question that is often asked is, 'What did the Soviets know about all this aerial intelligence collection activity in the Corridors and BCZ?' Talking with those that worked on the Corridor, BCZ and the ground liaison tours, there is absolutely no doubt among them that the Soviets and East Germans knew very well that the Western Allies were exploiting every opportunity they could to collect intelligence but they lacked the *prima facie* evidence of such activity on a systematic scale. There is also the perception that the Soviets and East Germans were not widely aware of just how good the quality of intelligence collected by the Allies was.

On the ground and in the air, the Allies tried not to flaunt the fact that they were using cameras and electronic devices to collect intelligence. These activities were officially never admitted by either side. Liaison mission tours generally kept their hand-held cameras either within their vehicles or close by, so that they could be quickly put back inside them if spotted. There, they were supposedly safe on 'sovereign territory'. Not only were mission members seen taking pictures but over the years, there were several instances of those cameras being stolen from their vehicles. Simply



A display of army level air defence equipment at the Colbitz training ground, presumably for a senior Soviet officer visit. Photographing such events were valuable targets for Corridor missions. (Crown Copyright via Medmenham Collection)

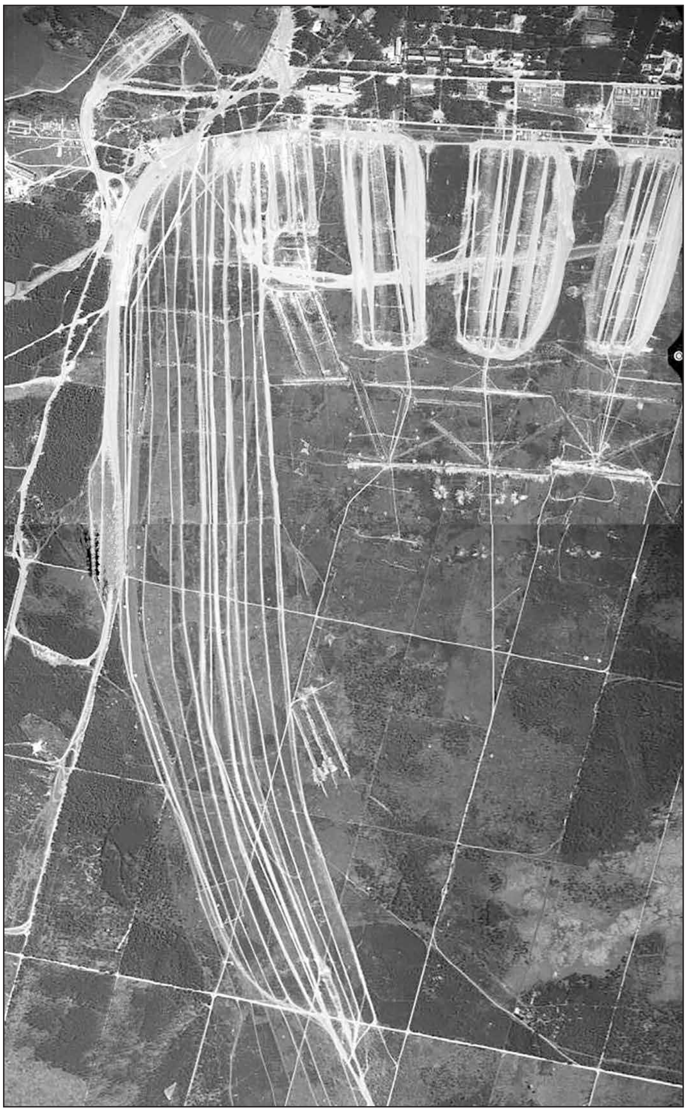
developing the films would have revealed that ground tours were taking photographs of installations, troops, equipment, key points, identification numbers and the like. However, to have challenged the Allies with the evidence would have meant having to admit they had stolen the equipment in the first place.

The same applied to imagery taken by aircrews from British, French and US light aircraft missions within the BCZ. On occasions, the aircraft observers pointing telephoto lenses out of the aircraft, were certainly seen. That the aircraft would often turn up at low-level over key installations, was a regular occurrence. There were several instances when ground troops fired their personal weapons at the aircraft and even caused minor damage. On a few even rarer occasions, the gun pointing was captured on film by the aircraft crews. Again, confronting the Soviets with images of their aircraft having guns pointed at them would have been to admit they were taking photographs.

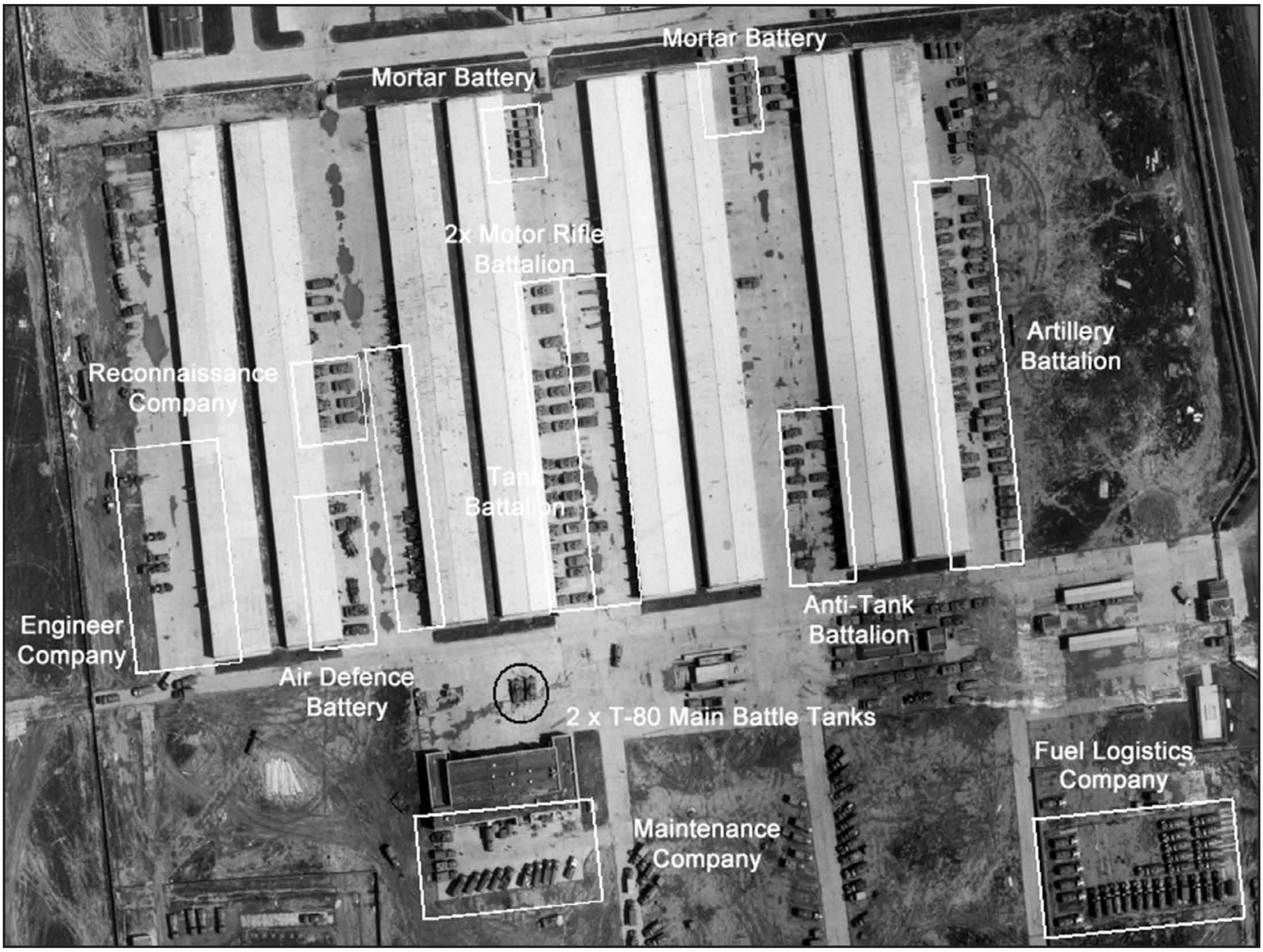
Such confrontations however were not always without humour. As mentioned, on one occasion, Commanding Officers from all three liaison missions were summoned to the Soviet's Potsdam HQ and wryly asked to explain how a camera lens had fallen from an Allied aircraft onto the Dallgow-Döberitz barracks area. A US Lark Spur aircraft had been photographing an entire tank regiment that had just returned from manoeuvres and was all lined up by the wash ramps.[1]

Squadron Leader Roy Mardsen was a British RAF navigator, assigned to BRIXMIS from 1973 to 1976. He has long asserted that the Soviets knew exactly what their Chipmunk and other low flying Allied aircraft were doing in the BCZ. Also that they largely turned a blind eye to it and many of the West's other intelligence gathering activities in and over Berlin and the GDR. He described that in meetings with Soviet SERB officers, they 'often made oblique references to those who participated, about the Chipmunk aircraft and where it had been seen over installations both inside and allegedly, outside the BCZ'.[2]

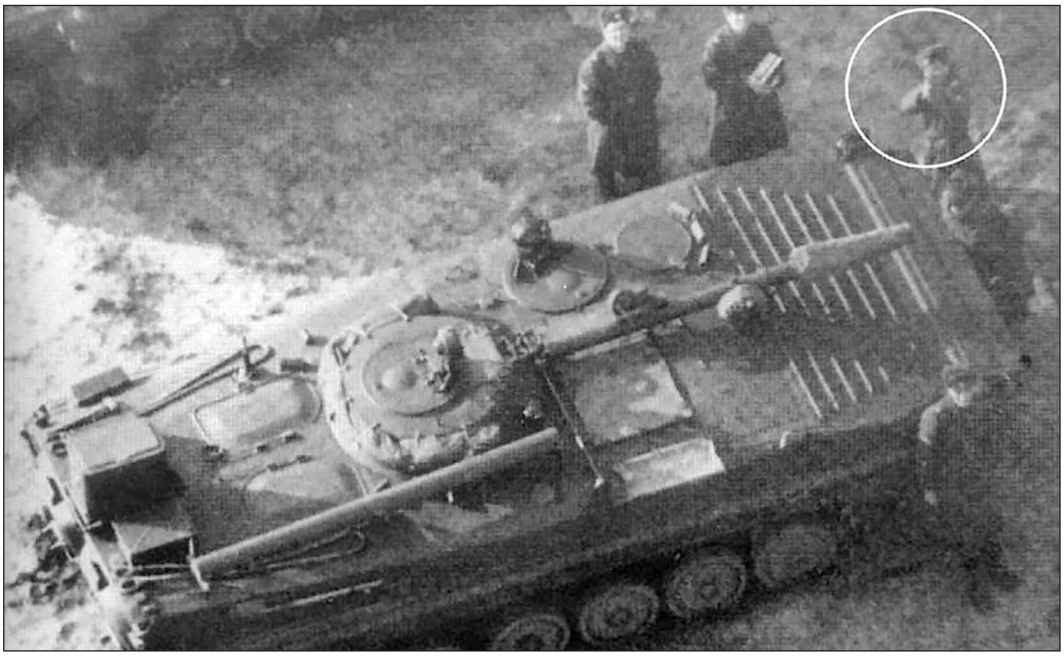
Corridor flights were of a very different order in their conduct and sophistication. Again, it was relatively easy to determine that these aircraft regularly transiting the Corridors were 'up to no



Regularly used firing ranges and training grounds such as Glücksburger Heide developed a very distinctive and easily recognisable appearance from the air. (Crown Copyright via Medmenham Collection)


Mortar Battery
Mortar Battery
2x Motor Rifle Battalion
Reconnaissance Company
Tank Battalion
Artillery Battalion
Engineer Company
Air Defence Battery
Anti-Tank Battalion
2 x T-80 Main Battle Tanks
Fuel Logistics Company
Maintenance Company

A BMP-2 equipped Motor Rifle Regiment was located at Schlotheim barracks, on the edge of the southern Corridor. It housed a considerable amount of equipment as revealed in this image including: an Engineer Company, Air Defence Battery with 2S6 'Tunguska', a Reconnaissance Company with BMP-2, a Tank Battalion with T-80, a Motor Rifle Battalion with BMP-2, Mortar Batteries with 120mm mortars, an Anti-Tank Battery with AT-5 Spandrel on BRDM-2, an Artillery Battalion with 2S1 122mm self-propelled gun and 1V series command and reconnaissance vehicles, a Fuel Re-supply Company with KrAZ-255 fuel bowsers (tank truck), a Maintenance Company, Two T-80 main battle tanks (MBTs) and an aircraft/helicopter refuelling unit (a lodger unit). (Crown Copyright via Medmenham Collection)



A Soviet soldier pointing his weapon to shoot at a low flying RAF Chipmunk in the Control Zone. All three missions had similar experiences but to complain about them to the Soviets would have been to admit to taking photographs. (Crown Copyright via Medmenham Collection)

good' and in broad terms, that is what it was. Nevertheless, making some sort of verifiable qualitative assessment of what they could see, must have been much more difficult. The patterns of behaviour were relatively easy to establish; departing from Rhein-Main, same aircraft with the same tail numbers, erratic progress down the Corridors, the intensity of their missions at key times of the year and so on. BASC flight plans accurately recorded the number of people on board and large crews getting in and out of specific C-130s at Tempelhof in flying suits and noted that no cargo was ever loaded or offloaded, were the most obvious indicators that something 'odd' was going on.

Another clear example of just how aware the Soviets were of Allied activities, comes from British files. It details an exchange that had taken place in the BASC control room between the British representative and Soviet Controller, Lieutenant Colonel Vasili Zakharov. An old British Pembroke aircraft was due to fly the Centre Corridor at FL55 (5,500ft), slightly higher than a bloc of airspace the Soviets had reserved for that day up to 4,000ft above one of their ground exercises. When Zakharov enquired why the British aircraft was not flying much higher to be safe, the British controller explained that, 'the Pembroke was old, had no oxygen and didn't like flying even as high as FL55'. Zakharov was said to have burst into laughter and replied, 'Don't be ridiculous, we all know that your Pembroke wants to fly as low as possible to get better pictures of our exercise under the Centre Corridor'.[3] There are several accounts of similar exchanges.

The Soviets' awareness of call sign associations with particular aircraft and their role, becomes clear in an account from US airman David Brogg. As was the contemporary practice, US Corridor aircraft used their tail number as part of their radio call signs. He recalled that on C-97G 53–0106, the microswitches used to extend and retract some of the antenna and equipment sometimes malfunctioned, especially in winter. When that happened, from inside the aircraft, it was impossible to tell how much of the antennae might still be extended. In such situations:

> The procedure was to declare an emergency and exit via the Centre Corridor, the shortest one … One December day in 1966, the ice would not let the antennae stow securely for three days in a row. After declaring the third emergency on the same aircraft, in the same week, the Soviet Controller in the BASC turned to his US counterpart and asked: 'What is the matter with your spy plane this week? This is the third time he has not landed here'.[4]

In West Berlin, Allied military personnel, who already knew of these intelligence collection flights, had reported on occasion, seeing Allied aircraft flying within the BCZ with their sensors exposed and adopting obvious photographic reconnaissance flight patterns as they went about their business. There can be no doubt that behaviour like this would not have been missed by the many Soviet and East German security and intelligence personnel watching them from the ground.

As long as the real role of the many Corridor missions was adequately hidden from the casual observer and not an open affront to Soviet sensitivities, there was no immediate need for the Russians to mount any face-saving response. This stands in stark contrast to the conduct of US overflights of the USSR in the 1950s and the Cold War long peripheral reconnaissance operations around its border. Incidents related to those missions caused several major diplomatic spats between East and West into the 1970s and resulted in significant loss of life. Despite regular interceptions of Corridor mission aircraft and sometimes harassment, not a single Allied military aircraft engaged in Corridor or BCZ reconnaissance operations, was ever brought down.

The vital work that the 'Berlin for Lunch Bunch' quietly undertook was a unique element in the US intelligence community. It was also probably significantly undervalued. They certainly made a major contribution to wider stability and security, in an often volatile Cold War world, offering reassurance, calming nerves at times of tension and providing an unrivalled view of the Soviet military. These factors validate the importance of their work, perhaps even more in retrospect today and encapsulated in the 7405th's Latin motto: '*Veritatem Suppeditare*' (To Provide the Truth).

BIBLIOGRAPHY

Aldrich, R. The Hidden Hand: Britain, America and Cold War Secret Intelligence, (London: John Murray, 2001)

Allen, K., 'Guided by BARTCC', The Airman, Vol. 11, No. 11, (November 1967)

Boyd, R., Project 'Casey Jones' 1945–46, Post Hostilities Aerial Mapping', (Offutt AFB, NE: SAC, 1999)

Boyne, W., The Berlin for Lunch Bunch (2012), https://www.airforcemag.com/article/0712berlin/ (accessed 5 May 2022)

Brugioni, D., Eyes in the Sky: Eisenhower, the CIA and Cold War Aerial Espionage, (Anapolis: Naval Institute Press, 2010)

Büttner, S., 'Beginning of the End', Aircraft, Vol. 42, No. 11, (November 2009), pp.72–79

Büttner, S., 'Nuclear Power', Aircraft, Vol. 42, No. 3, (March 2009), pp.64–71

Cargill Hall, R. and Laurie, C. (eds), Early Cold War Overflights: Symposium Proceedings, (Washington DC: Office of the Historian, NRO, 2003)

Corcroft, W. and Schofield J., Archaeology of the Teufelsberg, (Abingdon: Routledge, 2019)

Futrell, F., The USAF in SE Asia: The Advisory Years to 1965, (Washington DC: Office of AF History, 1981)

Geraghty, A., BRIXMIS: The Untold Exploits of Britain's Most Daring Cold War Spy Mission (London: Harper Collins, 1997)

Gibson, S., BRIXMIS: The Last Cold War Mission, (Stroud: History Press, 2018).

Grimes, W., The History Of Big Safari, (Bloomington, IN: Archway Publishing, 2014)

Hanyok, R., Spartans in Darkness: American SIGINT and the Indochina War, 1945–1975, (Washington DC: NSA/CSS, 2002) Series VI, Vol. 7

Harding, S., 'Freedom City Flyers', Soldiers, Vol. 45, No.22, (1990), pp.42-44

Harrington, D., (2008), The Air Force Can Deliver Anything, A History of the Berlin Airlift. (Washington DC: US GPO), pp.48–53. https://media.defense.gov/2018/Jan/24/2001869016/-1/-1/1/The%20Air%20Force%20Can%20Deliver%20Anything%20a%20History%20of%20the%20Berlin%20Airlift.PDF

Howard, P. and Campbell, C., 'Aircraft Survivability in MOUT: Berlin Case Study', US Army Aviation Digest, Vol.27, No. 6, (June 1981), pp.18–25

Klass, P., Secret Sentries in Space, (New York: Random House,1971)

Kuhrt, P., 'Looking Down on Berlin's Wall', Stars and Stripes, 11 August 1967

Lashmar, P., Spy Flights of the Cold War, (Stroud: Sutton Publishing, 1996)

Long, A., Cold War Berlin, An Island City Volume 1 – The Birth of the Cold War and the Berlin Airlift, 1945-1950, (Warwick: Helion, 2021)

Marsden, R., 'Operation 'Schooner/Nylon' RAF Flying in the Berlin Control Zone', Intelligence and National Security, Vol. 1, No. 4, (1998), pp.178–93

Martinot-Lagarde, J., (2009), Renseignement Électronique, (Limoges: La Vauzelle, 2009)

Miller, R., To Save a City: The Berlin Airlift 1948–49 (Washington DC: Bolling AFB, 1998)

Napier, M., In Cold War Skies: NATO and Soviet Air Power, 1949–89, (Oxford: Osprey, 2020)

Neubroch, H., 'RAF Element BRIXMIS: Further Recollections of Operational Experiences 1957–59', RAF Historical Society Journal, No. 23, (2001), pp.106–115

O'Laughlin, T., 'Hot Radios in The Cold War', Popular Communications, November 2010, pp.10–18

Penman Jones, J., 'Assignment Berlin', US Army Digest', Vol. 16, August 1970, pp.5–7

Rhodarmer, R., Recollections of an Overflight 'Legman', in Cargill Hall, R., and Laurie, C., (eds), Early Cold War Overflights: Symposium Proceedings, (Washington DC: Office of the Historian, NRO, 2003)

Seman, T., Cold War Intelligence: the United States Military Liaison Mission In East Germany 1947-1990, (MA Thesis, American University, 1994)

https://dra.american.edu/islandora/object/thesesdissertations%3A5174/datastream/PDF/view (accessed 10 May 2022)

Stanley, R., Asia from Above, (Bloomington IN: Authorhouse, 2014)

Stejskal, J., Special Forces Berlin: Clandestine Cold War Operations of the US Army's Elite, 1956–1990, (Oxford Casemate, 2017)

Tart, L., History Of The US Air Force Security Service, 1948-1979, Vol. II, (Conshohocken: Infinity Publishing, 2012)

USAFE, (1949), Berlin Airlift: A USAFE Summary 26 June 1948 to 30 September 1949, p.54. https://ia803004.us.archive.org/12/items/Berlinairlift00Unit/Berlinairlift00Unit.pdf (accessed 4 October 2021)

van Waarde, J., Target Iron Curtain, (2010) https://www.16va.be/TargetIronCurtain-JanvanWaarde2010.pdf

Wright, K., and Jefferies, P., Looking Down The Corridors, (Stroud: The History Press, 2017)

Wright, K., The Collectors: US and British Cold War Aerial Intelligence Gathering, (Warwick: Helion, 2019)

Wright, K., 'Blackbird Backseater', Aviation News, Vol. 82, No. 12, (December 2020), pp.24–30

Wright, K. and Dunnell, B., Wings of 'Freedom City', Aeroplane Monthly, Vol. 49, No. 8, (August 2021), pp.74–81

Online Archive Sources

Central Intelligence Agency:
CIA Records Search Tool (CREST): https://www.cia.gov/library/readingroom/
Red Stars over Germany:
https://www.16va.be/
UK National Archive:
The UK National Archive: http://www.nationalarchives.gov.uk/
US National Archive:
https://www.archives.gov/
US State Department, Office of the Historian, Foreign Relations of the United States (FRUS) https://history.state.gov/

NOTES

Chapter 1

1 For a detailed look at the structure of the USMLM, see: T. A. Seman, *Cold War Intelligence: the United States Military Liaison Mission In East Germany 1947-1990*, (MA Thesis, American University, 1994).

2 FRUS, Diplomatic Papers, Conference of Berlin (The Potsdam Conference), 1945, Vol. II Doc 710. Log of the President's Trip to the Conference.

3 TNA, DEFE 71/128, BASC Operations and Communications. This file provides a comprehensive description of BASC/BARTCC procedures.

4 TNA, DEFE 71/128.

5 TNA, DEFE 71/128. See also Volume 2.

6 In the 1946 agreement the BCZ is defined as 'the air space between ground level and 10,000ft'. TNA, AIR 55/257: Allied Control Authority, Air Directorate, Committee of Aviation, Flight Rules for Aircraft Flights in Air Corridors in Germany and Berlin Control Zone, TNA, DAIR/P(45)71 Revised, 31 December 1945. The agreement was slightly revised on 22 October 1946 with addition of a few clarifying definitions and list of designated Berlin airfields. See TNA DEFE 71/128.

7 Note from the Soviet Union to the US, protesting high level flights in the Frankfurt-Berlin Air Corridor, April 4, 1959. US Department of State Bulletin, May 4, 1959, p.634.

8 Rhodarmer, R, Recollections of an Overflight 'Legman', in Cargill Hall, R, and Laurie, C, (eds), *Early Cold War Overflights: Symposium Proceedings,* (Washington DC: Office of the Historian, NRO, 2003), pp.15–16.

9 Jan van Waarde (2010), *Target Iron Curtain*. http://www.16va.be/TargetIronCurtain-JanvanWaarde2010.pdf. (Accessed 5 October 2021)

10 R. Boyd, *Project 'Casey Jones' 1945–46, Post Hostilities Aerial Mapping',* (Offutt AFB, NE: SAC, 1999), p.1. https://www.306bg.us/library/Project%20Casey%20Jones%20-%20searchable.pdf (accessed 15 March 2022)

11 *Ibid* p.12.

12 R. Aldrich, The Hidden Hand: Britain, America and Cold War Secret Intelligence, (London: John Murray, 2001), p.213.

13 R. Boyd, Project 'Casey Jones', p.2.

14 www.maps.ch (accessed 15 March 2022) use advanced search facility and 1946 data set. http://www.eurosdr.net/sites/default/files/images/inline/heisig_etal_swisstopo.pdf (accessed 10 June 2022).

15 J. Bessette, http://creekmisty.fatcow.com/bflb/27443/index.html. (accessed 24 October 2021).

16 HQ USAFE, (1949), *Berlin Airlift: A USAFE Summary 26 June 1948 to 30 September 1949*, p.54. https://ia803004.us.archive.org/12/items/Berlinairlift00Unit/Berlinairlift00Unit.pdf (accessed 4 October 2021)

17 R. Miller, (1998), *To Save a City: The Berlin Airlift 1948–49* (Washington DC: Bolling AFB), p.70. Available at: http://www.afhso.af.mil/shared/media/document/AFD-101001–053.pdf. General Tunner became commander of the airlift operation.

18 P. Lashmar (1996), *Spy Flights of the Cold War* (Stroud: Sutton Publishing), p.33. For details of airlift ATC organisation see: DF Harrington, (2008), *The Air Force Can Deliver Anything, A History of the Berlin Airlift*. (Washington DC: US GPO), pp.48–53. https://media.defense.gov/2018/Jan/24/2001869016/-1/-1/1/The%20Air%20Force%20Can%20Deliver%20Anything%20a%20History%20of%20the%20Berlin%20Airlift.PDF (accessed 14 March 2022). It has not been possible to verify the assertion that Soviet observers had access to control towers in the Western Zones, but they could easily have looked over their perimeter fences.

19 R. Boyd, Project 'Casey Jones', p.2.

20 K. Wright, *The Coll*, W. Grimes, *The History Of Big Safari*, (Bloomington, IN: Archway Publishing, 2014), pp.1–3, 31. K. Wright, *The Collectors: US and British Cold War Aerial Intelligence Gathering*, (Warwick: Helion, 2019), pp.79–83.

Chapter 2

1 W. Grimes, *The History Of Big Safari*, (Bloomington, IN: Archway Publishing, 2014), pp.1–3, 31.

2 L.Tart, History Of The US Air Force Security Service, 1948–1979, Vol.II,

3 Grimes, *Big Safari*, pp.17–18, 52–53. Roy Stanley, *Asia from Above*, (Bloomington IN, Authorhouse, 2014), p.184. Robert F Futrell, *The USAF in SE Asia: The Advisory Years to 1965*, (Office of AF History, Washington DC 1981) p.276. https://media.defense.gov/2010/May/25/2001330284/-1/-1/0/AFD-100525-052.pdf and R Hanyok, *Spartans in Darkness: American SIGINT and the Indochina War, 1945–1975*, (NSA/CSS, Washington DC: 2002) Series VI, Vol. 7, pp.131–32. https://www.nsa.gov/portals/75/documents/news-features/declassified-documents/cryptologic-histories/spartans_in_darkness.pdf, (accessed 10 January 2022).

4 K. Wright, *The Collectors*, pp.217–8 and Brill, US Intelligence on Europe 1945–1995, Cable CINCUSAFE to COFS in Washington DC, November 30, 1954.

5 Grimes, *Big Safari*, pp.19–20.

6 *Ibid*. pp.21–22.

7 CIA CREST: CIA-RDP89B00708R000500050002-8, pp.30-33, (accessed 2 December 2021).

8 *Ibid*. p.29, (accessed 2 December 2021).

9 Grimes, *Big Safari*, pp.23–24.

10 Interview John Bessette.

11 The T-11 cameras successor, the KC-1, was an updating of the T-11 and the two used interchangeable mounts.

12 https://www.asprs.org/wp-content/uploads/pers/1964journal/jan/1964_jan_97-110.pdf, pp.104–5.

13 Grimes, *Big Safari*, pp.27–28.

14 L.Tart, *History Of The USAFSS*, 1948–1979, Vol.II, pp.585–88.

15 *Ibid*. p.695

16 W.D. Cocroft and J. Schofield, (2019), *Archaeology of the Teufelsberg*, (Routledge: Abingdon), pp.40–54.

17 Terry O'Laughlin, 'Hot Radios in The Cold War', *Popular Communications*, November 2010, pp.17–18.

18 Cocroft and Schofield, pp.13–19, K. Wright, 'Blackbird Backseater', *Aviation News*, Vol. 82, No. 12, (December 2020), pp.24–30.

Chapter 3

1 Grimes, *Big Safari*, p.41.

2 K. Wright, *The Collectors*, pp.52–56. BUORL was later acquired by ITEK, famous, among other things, for its design of space based reconnaissance cameras.

3 William Britton collection. He was a later employee of the ITEK corporation and became the archivist who assembled a fascinating

collection of material relating to BUORLs reconnaissance related work.

4 Britton Collection, Howard Gotlieb Archival Research Center, Boston University.

5 BU, Gotleib Research Centre, BUORL Archive.

6 Grimes, *Big Safari*, p.11.

7 Brill, US Intelligence on Europe 1945-1995, USAF CoS Vandenburg to CinC USAFE

8 Grimes, *Big Safari*, pp.11-12.

9 *Ibid*. p.6. and p.13.

10 It became tradition among the crews to refer to the largest camera carried on the aircraft as the 'Big Item'.

11 Klass, P, Secret Sentries in Space, p.85.

12 Grimes, *Big Safari*, pp.13-14.

13 Brugioni, *Eyes In The Sky*, p.75.

14 Eisenhower Presidential Archive: Memorandum of Conference with the President, August 9, 1960. https://www.eisenhower.archives.gov/research/online_documents/aerial_intelligence/1960_

15 CIA, CREST, CIA-RDP81B00878R000800100040-4.pdf, Development of aerial photographic processing equipment, p.4.

16 Grimes, *Big Safari*, pp.15-16.

17 K.Wright and P. Jefferies, *Looking Down The Corridors*, pp.177–79.

18 Hans Neubroch, 'RAF Element BRIXMIS: Further recollections of Operational Experiences 1957–59', *RAF Historical Society Journal*, No. 23, (2001), pp.106–15.

19 Grimes, *Big Safari*, p.38, William H. Nance, 'Quality ELINT', *Studies in Intelligence*, 12, 2 (Spring 1968).

20 Grimes, *Big Safari*, p.38.

21 *Ibid*. pp.37-38.

22 *Ibid*. pp.36-37.

23 Some NPIC reports from these missions are available from the CIA CREST Archive Eg CREST: CIA-RDP78B04560A003900010024-0.pdf.

24 Grimes, *Big Safari*, pp.36-38.

25 *Ibid*. pp.41-42.

26 J. van Waarde, *Target Iron Curtain*, p.7.

27 Grimes, *Big Safari*, p.41.

28 *Ibid*. pp.115–17.

29 History 7406th SS, http://www.7406supportsquadron.com/history/index.asp (accessed 10 May 2022).

30 Tart, *Freedom*, IV, 1, pp.1814-15.

31 The National Museum of the USAF website has some wonderful 360 views of a KC-97L flight deck which show the crew positions for the forward flight crew on the very similar C-97, except it shows no second navigator seat and has a more extensive flight engineer's refuelling control panel. https://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/196737/boeing-kc-97l-stratofreighter/ (accessed 11 January 2022)

Chapter 4

1 Grimes, *Big Safari*, pp.253–54. The other two Witch Doctor aircraft were 62-1821 and 62-1827.

2 *Ibid*. p.276.

3 If you are not familiar with the internal configuration of a standard C-130 transport the Air Mobility Command Museum, have a brief internal 'video tour' that will provide a good understanding of how restricted the space would have been with all the camera and SIGINT equipment in place. https://amcmuseum.org/at-the-museum/virtual-tours/c-130e-hercules-video-tour/ (accessed 19 May 2022).

4 Grimes, *Big Safari*, pp.277–78.

Chapter 5

1 https://www.mil-airfields.de/de/altes-lager.htm (accessed 29 April 2022).

2 http://www.airforce.ru/content/ (accessed 29 April 2022).

3 Stefan Büttner, 'Beginning of the End',*Aircraft*, November 2009, pp.72–79 and 'Nuclear Power, ' *Aircraft*, March 2009, pp.64–71.

Chapter 6

1 S. Harding (1990), 'Freedom City Flyers', *Soldiers*, Vol. 45, No. 22, pp.42–4.

2 The National Archive: PRO FO371/163670, Telegram 639, Gen. Dunbar to Foreign Office, 19 July 1962.

3 P. Kuhrt, 'Looking Down on Berlin's Wall', *Stars and Stripes*, 11 August 1968.

4 K. Wright and Ben Dunnell, (2021), Wings of 'Freedom City', *Aeroplane Monthly*, Vol. 49, No. 8, (August 2021), pp.74–81.

5 P. Kuhrt, *Stars and Stripes*, 11 August 1968.

6 J, Penman Jones, (1970), 'Assignment Berlin', *US Army Digest'*, Vol. 16, August 1970, pp.5–7.

7 P.C. Howard and C.J Campbell, (1981), 'Aircraft Survivability in MOUT: Berlin Case Study', *US Army Aviation Digest*, Vol.27, No. 6, June 1981, pp.18–25.

8 J. Stejskal, (2017), Special Forces Berlin: Clandestine Cold War Operations of the US Army's Elite, 1956–1990, (Casemate: Oxford: 2017).

9 http://home.att.net/~rw.rynerson/berair.htm (accessed 19 April 2022 via Wayback Machine).

10 Memo for Director of Central Intelligence from Deputy Director Intelligence, *JRC* Monthly Reconnaissance Schedule for January 1968, 2 January 1968.

11 My thanks to Hugo Mambour for allowing me to quote extensively from his interview. http://www.16va.be

12 Some accounts indicate it was Krampnitz barracks.

13 H. Mambour: http://www.16va.be/operation_Lark Spur2_part1_eng.html.

14 S. Harding (1990), 'Freedom City Flyers', *Soldiers*, Vol. 45, No. 22, pp.42–4.

Chapter 7

1 Ken Allen, 'Guided by BARTCC', *The Airman*, Vol. 11, No 11, (Nov 67), p.16. A detailed summary of Tempelhof's layout and equipment is detailed at: https://www.mil-airfields.de/ de/berlin-tempelhof-central-airport.htm (accessed 23 March 2022).

2 TNA, DEFE 71/128, Order No. 21, Controllers Duties at Tempelhof.

3 Grimes, *Big Safari*, pp.88–89.

4 https://www.thedrive.com/the-war-zone/42369/two-nato-fighters-accidentally-flew-behind-the-iron-curtain-60-years-ago-today (accessed 22 November 2021) and 'Beer Order 61', *Der Spiegel*, May 8, 1962.

5 AMLM Annual Report 1964, pp.12–16.

6 M. Napier, *'In Cold War Skies: NATO and Soviet Air Power, 1949–89'*, (Osprey, Oxford, 2020), pp.108–9.

7 USMLM Annual Report 1964, pp.15–18.

8 J Martinot-Lagarde (2009), *Renseignement Électronique*, pp.83–4.

9 https://www.key.aero/article/escape-west berlin (accessed 18 November 2021).

10 https://apnews.com/article/3ffb88b35195ef8526dae0dd92677c59 (accessed 24 November 2021).

11 Geraghty, *BRIXMIS*, pp.246–49.

12 http://www.coldwarspies.com/resources/nicholson1.pdf pp.6-21. (accessed 19 November 2021).

13 Wright and Jefferies, *Looking Down The Corridors*, p.73.

14 W. Boyne (2012), *The Berlin for Lunch Bunch*. Available at: http://www.airforcemag.com/MagazineArchive/Pages/2012/July%20 2012/0712berlin.aspx.

Chapter 8

1 Wright and Jefferies, *Looking Down the Corridors*, pp.138–39.

2 R. Marsden, ‘Operation “Schooner/Nylon” RAF Flying in the Berlin Control Zone’, *Intelligence and National Security*, Vol. 1, No. 4, (1998), p.192.

3 TNA, FCO 33/5905, BASC/5/AIR, 23 July 1982.

4 David Brog to Stephen Barranco communication, 26 February 2008.

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Having taught Cold War history, international security and politics at the University of Essex from where he gained his PhD, Kevin Wright is now a regular contributor to several UK aviation magazines. Publications have included books on Cold War aerial intelligence, historical aviation articles and contemporary military topics. His lifelong interest in military aviation continues with further Cold War research, including a special interest in CIA aerial operations, and enjoyment of opportunities for air-to-air photography.